

THE MEDICAL JOURNAL OF AUSTRALIA



VOL. II.—14TH YEAR.

SYDNEY: SATURDAY, JULY 23, 1927.

No. 4.

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MEDICAL ASPECTS OF EMPYEMA.¹

By A. V. M. ANDERSON, M.D.,
Melbourne.

WHEN a physician in the course of his attendance on a patient diagnoses or suspects the presence of pus in the pleural cavity, the necessity for consultation with or transference of the patient to a surgeon must be considered. From the medical point of view therefore the question of diagnosis is of the greatest importance and my remarks will be devoted mainly to this aspect of the subject.

The organisms concerned in empyema are the pneumococcus, streptococcus, influenza bacillus and less frequently the tubercle bacillus and the colon bacillus. Of these the most important from the physician's point of view is the pneumococcus. The incidence of empyema has been estimated at from 2% to 5% of all cases of lobar pneumonia.⁽¹⁾ A certain amount of pleurisy is present in most cases of this disease; it is probable that in many of these a small amount of sterile serous fluid is present and is absorbed. During the last two years I have seen several instances of serous effusions in patients whose illness appeared to begin as a lobar pneumonia. The medical attendant is inclined to suspect in such cases a tuberculous condition and this possibility must always be kept in mind and the patient warned of future possibilities. It should in all cases of lobar pneumonia be remembered that empyema may possibly supervene and it is wise at the earliest examination of a patient to note exactly the position of the cardiac apex in view of the possibility of its alteration later by the presence of fluid effusion.

It is said that pus may be found in pneumococcal empyema as early as the fourth or fifth day.⁽²⁾ It is, however, at the time when the crisis is expected, shortly after the end of the first week of the disease, that it most commonly occurs. Either the temperature does not fall or after the crisis the temperature rises again without any evidence of a fresh pneumonic patch or any other complication. A diagnosis may then be made of an unresolved pneumonia. It has been said with much truth that in the great majority of cases believed to be due to delayed resolution the cause of the failure of the lung to return to its normal state is the presence of pus in the pleural cavity. There is no doubt that resolution may be delayed beyond the ordinary period. This, however, is much more common in lobular than in lobar pneumonia. Professor Cleland, in an article in a recent issue of THE MEDICAL JOURNAL OF AUSTRALIA,⁽³⁾ states that a remarkable feature of *post mortem* examinations at the Adelaide Hospital has been the relative persistence of organization of the exudate following either lobar or bronchopneumonia. In several cases definite carnification had occurred and he considers that organization of a pneumonic exudate is more common than is generally thought. However this may be, the persistence of physical signs and especially

if the temperature remains high, should lead to the suspicion of empyema. Norris and Landis have pointed out the difficulties that may occur in the diagnosis of pleural effusion.⁽⁴⁾ The presence of fluid in the pleura is usually indicated by the diminution of breath sounds and of voice sounds as contrasted with tubular breathing and increased vocal resonance and vocal fremitus in consolidation. One of the main points which determine the physical signs in these conditions is the openness of the bronchial tubes. In massive pneumonia the blocking of the large bronchial tubes by the exudate may give the diminished breath sounds and voice sounds that seem to indicate an effusion. Again with a small effusion into the pleura the breath sounds may come through the compressed lung and even bronchial breathing may be heard over a serous or purulent effusion. It is stated that definite signs are frequently absent with effusion under four hundred cubic centimetres in amount. In empyema stress has been laid on Bacelli's sign, namely the diminution or absence of transmission of the whispered voice as compared with its readier passage in serous effusion. The value of this sign is doubtful. So with bulging of the intercostal spaces; if fluid is suspected, its nature is best determined by the use of the exploring syringe.

A leucocyte count is frequently of much value and increase of leucocytes after the tenth day or the persistence of leucocytosis after that time is very suggestive of pus. Occasionally the development of tuberculosis in a consolidation that is not subsiding, may be suspected and here the value of the white blood count for diagnosis is considerable.

The diagnostic importance of alteration of the position of the heart's apex is of most value in left sided effusion. In right sided pneumonia dilatation of the heart may cause a deviation to the left which may make the medical attendant suspect a right sided effusion. Still in all cases of altered position of the apex beat the value of the sign is indubitable. An alteration of Traube's space in left sided effusions is also of value, as is the presence of Grocco's triangle at the base of the opposite lung. This latter sign is not infallible and especially so when a small patch of pneumonic consolidation may be present at the base of the other lung. Contrary-wise, where adhesions around the purulent effusion quickly form Grocco's triangle may not be demonstrable.

Of late years much help has been got from the use of X rays and in doubtful cases the assistance of the radiographer should always be obtained when possible. In some of the American military camps in war time it was a standing rule in the wards for pneumonic patients that an X ray examination should be performed whenever there was the slightest suspicion of fluid in the chest, and in all pneumonic patients at the end of fourteen days.⁽⁵⁾ In these hospitals X ray facilities were always available in the wards for pneumonic patients. We know the difficulty and danger that may occur in transferring a pneumonic patient some distance to the X ray department and it would be well if we could imitate the American example. When a patient

¹ Read at a meeting of the Victorian Branch of the British Medical Association on June 1, 1927.

with pneumonia is being treated in a small private hospital with no facilities for X ray examination, the difficulties of exact diagnosis are obvious and this fact accentuates the necessity for the large, well equipped private hospitals such as exist in America.

One point of importance in late pneumonic consolidation may be the presence of a hydatid cyst which is suppurating. Here the value of the X rays is considerable.

The final arbiter in the diagnosis of empyema is of course the use of the exploratory needle and this must be resorted to whenever the diagnosis is still in doubt. The reckless or unnecessary use of the needle is to be deprecated and students should be encouraged to make a diagnosis if possible by the physical signs before resorting to puncture of the chest. Puncture of the pleura or lung is not without risk, although Capps⁽⁶⁾ states that no harm results even if the lung is punctured. Our knowledge of pleural shock in the production of artificial pneumothorax for tuberculosis of the lung has thrown considerable light on fatalities in chest puncture. Many deaths have occurred from the use of the exploratory syringe. In *The Lancet* of May 1, 1907,⁽⁷⁾ ten such fatalities were recorded. Cordier⁽⁸⁾ a few years later reported eighty-four cases of pleural shock and Dayton⁽⁹⁾ in the following year fifteen fatal cases following thoracentesis. Dr. Thomas Oliver,⁽¹⁰⁾ in reporting two deaths, gave it as his opinion that exploratory puncture should never be regarded as a trifling procedure. It was at one time believed that puncture of a solid lung was the cause of death, but this is probably not the only cause. Before the needle is used in doubtful cases it may be advisable to endeavour to diminish shock by local anæsthesia, or morphine injection as in the first attempt at producing artificial pneumothorax. Personally, I have never seen any deaths from exploratory puncture. There are many cases, as you all must have seen, in which an absolute diagnosis cannot be made without it.

Difficulties arise, not so much in the ordinary basal empyema which is not limited by adhesions, as in cases of encysted or interlobar empyema. A tendency to loculation is said to occur in 3% of cases.⁽¹¹⁾ James, of Edinburgh,⁽¹²⁾ estimates the proportion as 40%, but this seems unduly high. The lobulation may occur towards the base of the lung or between the upper lobe and the mediastinum or between two of the lobes of the lung. Occasionally the pus may spread below the diaphragm and a subphrenic abscess may form secondarily. It is in these unusual cases that X rays are of much assistance. It is important to remember the position of the interlobar septa, the main division being indicated by a line round the chest from the third vertebra posteriorly to the junction of the seventh and eighth costal cartilage anteriorly, the smaller division on the right side coming forward from this in the fourth costal space.

Where localization is difficult the desirability of an exploratory thoracotomy must be considered and some observers⁽¹³⁾ hold that this operation can be performed with as little risk as an abdominal ex-

ploration and that it should be used in all doubtful cases.

Streptococcal empyema is not so frequently met with in the practice of the physician. Dr. J. R. Williams,⁽¹⁴⁾ in an interesting *résumé* of the cases of empyema at the Melbourne Hospital between the years 1919-1924, records thirty-six cases of pneumococcal, twenty-eight of streptococcal and six of staphylococcal empyema. These figures probably relate to a time when epidemic influenza was present with streptococcal infection, and most of us remember the virulence and fatality of this disease and its tendency to rapid formation of pleural pus. It is said that in influenzal empyema the condition in the pleura is almost invariably the result of rupture of a small subserous abscess or suppurating bronchopneumonia into the pleura.⁽¹⁵⁾ Wade believes that this is the cause of most empyemata. Generally, of course, the incidence of empyema is not so great in the lobular as in the lobar form of pneumonia, but in the influenzal form of pneumonia which is usually lobular and in which both the pneumococcus and the *streptococcus hæmolyticus* occur, the incidence is much more than in the lobar form. MacNalty and Malloch⁽¹⁶⁾ record that empyema was found in fifteen out of fifty-five autopsies following fatal influenza and in 1,100 cases of pneumonia occurring at Camp Pike in America during the influenza epidemic 9.02% of patients developed empyema.⁽¹⁷⁾ The mortality is three times as great in influenzal as in the ordinary pneumococcal empyema. An important point to be remembered is that in influenzal empyema there is usually a comparatively low leucocytosis.

Another class of case in which empyema occurs and which one occasionally sees in consultation is that which takes place after surgical operations, generally in the abdominal cavity. I believe that in many abdominal operations pulmonary emboli occur and possibly the infection in such cases spreading to the pleura may be responsible for the pleural suppuration. These conditions, however, like *Bacillus coli* empyema, belong rather to the surgical aspect of the disease. Empyema in these circumstances is often only one of the factors to be considered in what may be regarded as a septicæmia.

Tuberculous empyema is comparatively rare except in rupture of a vomica into the pleural cavity. Infection after repeated tapping for serous effusion is also rare. Capps⁽¹⁸⁾ gives the frequency of this complication as a little more than 1%—sixteen in 1,185 cases.

It is generally recognized that it is a matter of the highest importance to diagnose empyema as early as possible. The dangers of delay in diagnosis and appropriate treatment are several. The longer the adhesions remain, the firmer do they become and the greater the difficulty in subsequent expansion of the lung. The long continuance of sepsis from pus retention has a very debilitating effect on the patient and may injure his health permanently. There is said to be a very harmful effect on the diaphragm partly by its inactivity and partly by the effect of inflammation of its muscular tissue.

Again there is a possibility of rupture of the pus cavity through the chest wall (*empyema necessitatis*) or a more serious happening through a bronchus. Sometimes the pus is expectorated with no harm resulting to the patient, but on the other hand he may be drowned by the influx of the fluid into the bronchial tubes. Then again a persistent bronchial fistula may be a source of much trouble.

Certain complications may occur as the result of the pleural suppuration. Suppurative pericarditis may follow. Pulmonary abscess and gangrene are also complications and such conditions as general peritonitis, endocarditis *et cetera* must be borne in mind. Dr. Williams in his article states that there were seven cerebral abscesses in one hundred and thirty-nine patients with empyema at the Melbourne Hospital. This is a much larger proportion than is given by most authorities.

Empyema is often either unrecognized or untreated till a late stage of the disease and unsuspected empyemata are occasionally met with in *post mortem* examination. Dr. George J. Heuer⁽¹⁹⁾ gave the figures in 455 patients with empyema admitted to the Johns Hopkins Hospital and the Cincinnati General Hospital. Out of 425 patients 213 were admitted whose symptoms had lasted from one to four weeks. One of these had been operated on. Eighty-one patients were admitted with symptoms lasting one to three months, four had been operated on. Forty were admitted three to six months after the incidence of symptoms with fourteen operations and twenty-one were admitted from six to twelve months after the beginning of the disease, eleven of these had been operated on. Thus not many more than 50% of patients came in promptly for treatment.

The mortality of empyema varies mainly according to the age of the patient and the nature of the infection. Heuer says that the mortality is:

Under the age of two years	39%
From two to five years of age	16.4%
From five to ten years of age	1.6%
From eleven to twenty years of age	11%
From twenty-one to thirty years of age	16%
From thirty-one to forty years of age	17%
From forty-one to fifty years of age	34.8%
Over fifty years of age	7.7%

The postpneumonic mortality was 10.9%, in tuberculous empyema the mortality was 42.8%, in postoperative empyema 41%, in posttraumatic 33% and in miscellaneous infections 40.5%.

The treatment is of course mainly a surgical matter, but there are a few points to which I should like to refer. Dr. Hector Cameron⁽²⁰⁾ has divided empyema into synpneumonic and metapneumonic empyema, the former occurring during the existence of the inflammatory condition of the lung and the latter after the subsidence of the pneumonia. He states that the former requires aspiration and the latter open operation. He quotes also the results of a large number of cases. With the primary open operation eighty-five patients were operated on with 61% of deaths. With early aspiration and later open operation in an early series of ninety-six patients the mortality was 15.6%; in a later series

of operations on ninety-four patients the mortality was 9.5%.

Where there is double empyema or empyema of one side of the chest with acute pneumonic trouble on the other, aspiration is definitely safer. These remarks apply with greater force to the treatment of influenzal empyema. If aspiration is to be performed, it should be according to Golding Bird's method, that is to say, when fluid flows into the bottle of the aspirating apparatus the tube leading from the chest is nipped and the fluid allowed to flow by siphonage into an antiseptic solution.

It is usual to explore before aspirating or operating. Generally it may be said that the more serous the effusion, the more likely is aspiration to be all that is necessary. It is always advisable to examine bacteriologically the fluid removed by exploration. Serous effusions may be anything but sterile and may require evacuation by an open operation. Sometimes an infected effusion may become sterile after repeated aspirations. Mr. McAdam Eccles⁽²¹⁾ states that the pleura will deal with infected material as well as the peritoneum, if the fluid in the pleura is well evacuated.

The report of the American Empyema Commission⁽²²⁾ states that in influenzal empyema repeated tapping is better than the open operation and that tapping may be followed later by operation with advantage.

The general preference nowadays is for local rather than general anaesthesia, but if a general anaesthetic has to be administered, the operation for empyema is the one operation at which the anaesthetist is the director of the operating theatre and his commands must be obeyed.⁽²³⁾

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TREATMENT OF EMPYEMA IN CHILDREN.¹

By RUPERT M. DOWNES, C.M.G., M.D., M.S., F.C.S.A.,
Surgeon to Children's Hospital, Melbourne.

THE treatment of empyema in children is a subject that has always given rise to a great deal of thought in those who meet many such cases, and not a little misgiving as to whether the results of treatment as regards mortality should not be more satisfactory. The death rate in young children is notoriously high.

In considering the results of treatment it is very necessary, however, to take into consideration the etiology, bacteriology and clinical condition which have an important bearing on the prognosis. For the purpose of this discussion I have made an analysis of the histories of 446 patients with empyema treated in the Children's Hospital in nine and a half years. While this has brought to light some interesting facts, more or less confirmatory of other investigations, I am afraid that I can deduce little in the way of treatment that is not already everyday knowledge.

The total number of deaths (one hundred and twenty-eight) gives a mortality of 29% in this series. But it is apparent that these deaths can be grouped into two classes. In the first class are those deaths in which the empyema can only be regarded as one factor and often a minor factor in the clinical picture. Examples are pneumonic pyæmia, meningitis and peritonitis, generalized tuberculosis, intrathoracic sarcoma and pyelphlebitis secondary to appendiceal abscess; in these conditions death is probably largely independent of the empyema. In this class, which accounts for sixty-three deaths, I have included on account of their bearing on the results of treatment, patients who have not undergone operation. The number of these was fifty and it is remarkable to find that the reason why operation was not performed, was in the majority failure to diagnose the presence of pus in the pleural cavity prior to death. This emphasizes what is well recognized, namely, that the diagnosis of empyema is often extremely difficult, especially in infants, among whom the majority of these undiagnosed cases occurred.

The second class comprises those cases in which there is no excuse apart from the primary pneu-

monia from which the empyema has arisen, for failure of treatment. If treatment be considered in relation to this class alone, the mortality is only 17%.

Age and Relation to Mortality.

Table I shows the age incidence and mortality rates at the ages from birth to fourteen years.

TABLE I.—SHOWING INCIDENCE OF EMPYEMA AND MORTALITY RATES FROM BIRTH TO FOURTEEN YEARS.

Age Period.	Number of Cases.	Deaths.		Percentage in Class II (Amenable to Treatment).
		Number.	Percentage.	
0 to 1 ..	54	32	59	35
1 to 2 ..	43	27	61	39
2 to 3 ..	57	16	28	16
3 to 4 ..	38	9	24	9
4 to 5 ..	28	5	18	15
5 to 6 ..	39	4	10	8
6 to 7 ..	37	4	11	3
7 to 8 ..	31	3	10	7
8 to 9 ..	25	3	12	8
9 to 10 ..	15	3	20	8
10 to 11 ..	16	2	13	7
11 to 12 ..	7	0	—	—
12 to 13 ..	7	4	57	25
13 to 14 ..	7	0	—	—
Total ..	446	128	29	17

In Table II the deaths are separated into the two classes just mentioned.

TABLE II.—SHOWING ANALYSIS OF DEATHS.

Age.	Number in Class I.	Number in Class II.	Total.
0 to 1 ..	20	12	32
1 to 2 ..	16	27	43
2 to 3 ..	8	8	16
3 to 4 ..	6	3	9
4 to 5 ..	1	4	5
5 to 6 ..	1	3	4
6 to 7 ..	3	1	4
7 to 8 ..	1	2	3
8 to 9 ..	1	2	3
9 to 10 ..	2	1	3
10 to 11 ..	1	1	2
11 to 12 ..	—	—	—
12 to 13 ..	3	1	4
13 to 14 ..	—	—	—
Total ..	63	65	128

It is seen in these two tables that the greatest incidence of the disease is during infancy, with a fairly regular decrease towards the later years of childhood. These agree with other similar lists published. The number of deaths in the period of infancy is 59% of the whole. The death rate in the first year, 59%, however, is not so high as that mentioned by speakers at the British Medical Association Annual Meeting in 1925, Souttar⁽¹⁾ giving it as 86%. An improvement in prognosis corresponding to the decreasing incidence with increasing age is also noted.

The figures in Table II suggest, as Cameron⁽²⁾ has stated, that there is a greater tendency in infancy to infection of other parts of the body by the organism responsible for the empyema. A further reason advanced by Cameron for the high infantile mortality is that the acute pneumonic process is more drawn out in infancy, so that the

¹ Read at a meeting of the Victorian Branch of the British Medical Association on June 1, 1927.

complicating empyema is generally present, while the pneumonia persists. I do not think that our experience entirely supports this view.

Bacteriology.

The relative occurrence of causal organisms in the cases in which the bacteriology is known, is shown in Table III.

The preponderance of the pneumococcus is in decided contrast to the figures given by the Empyema Commission of the United States Army,⁽³⁾ where in 2,820 empyemata (of course, in adults) the streptococcus was present in 70%, the pneumococcus only in 27%. The death rate, however, was lower too for pneumococcus in comparison with staphylococci and streptococci.

Pathology.

The only remark I have to make concerning pathology is that the occurrence of multiple subpleural abscesses, the bursting of which may be the direct cause of the empyema, which was so frequently found by the Empyema Commission of the United States Army has been found only as the exception in *post mortem* examinations at the Children's Hospital.

Secondly, while Fraser, of Edinburgh, states that the majority of cases of empyema follow bronchopneumonia, the records I have examined, show on the contrary that lobar pneumonia is primary in the great majority, while there are many in which it is not clear whether the pneumonia is lobar or lobular.

It is worth mention too that only three cases of interlobar collections were recognized and that no cases of cerebral abscess nor of persistent bronchial fistula are recorded.

Diagnosis.

The connexion of the surgeon with empyema is usually after someone else has made the diagnosis. I have little to say therefore on the matter. The difficulty of diagnosis has already been mentioned. Whenever there is any doubt, the exploring needle should be used; even with the needle it is often difficult to find small collections of pus, especially if they are interlobar. One point worth mentioning is the unreliability of physical signs once the exploring needle has been used; the interpretation of percussion and auscultation sounds is then often most misleading.

The same difficulty of diagnosing collections of pus arises even more prominently postoperatively after pus has been removed by aspiration or after drainage has ceased, especially as it is common to get temporary exacerbations of fever during a normal convalescence after operation. Whether the rise of temperature betokens a new collection is

often very difficult to decide. X ray diagnosis is relied on by many, but the decision as to whether a shadow at the base of the lung is pus, thickened pleura or consolidated lung is so often incorrect that it is hard to place much reliance on it in any individual case. Perhaps the most helpful guide is any change in the position of the apex beat of the heart; in the case of infants with a right pleural collection the heart is displaced upwards rather than to the left, so that the apex beat may be as high as the third interspace.

Treatment.

The treatment of empyema is simple and the results outside infancy satisfactory, if there is nothing beyond the empyema to treat. By this I mean the more common cases in which a short time after the subsidence of the acute pneumonia the empyema makes its appearance without other complications. There are complications such as pericarditis, from which 92% of the thirteen patients in the Children's Hospital who had it as the sole complication, died. It is complications apart from the damaged lung and pyæmia that are mostly responsible for the high mortality and I would hazard the opinion that any future advance in treatment will come less from the surgeon than from the physician and laboratory. The wide range of operations described show the efforts that are made in the direction of improving results and at the same time is a commentary on the unsatisfactory nature of them all. It is most striking to notice how at the British Medical Association Annual Meeting in 1925 and the Australasian Medical Congress (British Medical Association) in 1923 every principle or method of treatment favoured by one group of men of experience is condemned by some other. As there is no time tonight to discuss the pros and cons of these different principles and operations, I hope I shall be excused if I am somewhat dogmatic. One principle, however, which seems to meet with no opposition, is that open operation is to be strongly condemned during the period when the pneumonic process is acute. In the American epidemic there were in some camps in which operation was performed during the acute stage, mortalities of nearly 90%. Aspiration followed by operation at the later stage reduced the mortality to from 4% to 40%. It appears that the asphyxia from the open pneumothorax produced by operation is too great a burden on the patient in the acute pneumonic stage. This information is a legacy of the Great War. However, examination of the Children's Hospital histories shows that the occurrence of recognizable empyema in the course of the pneumonia is exceptional; none the less the combination should be watched for. I have at present one of the exceptions under treatment.

TABLE III.—SHOWING RELATIVE OCCURRENCE OF ORGANISMS.

Organisms.	Number.	Percentage.	Total Deaths.	Percentage Death Rate.	Number in Class II.	Percentage in Class II.
Pneumococcus	252	81	67	27	42	19
Staphylococcus	39	13	13	33	9	26
Streptococcus	19	6	9	47	4	29

The more common operations for empyema are rib resection, intercostal incision and aspiration. Rib resection is by far the commonest, whether as the primary operation or less often when one of the other operations has appeared ineffective. It accounted for 76% of the operations in the histories I have reviewed. Intercostal incision alone was done in 13% and aspiration alone in 8% or followed by other operation in 20%. The death rate after resection is slightly the lowest, but in the patients that recovered, the average time before discharge from hospital is greater than with the other operations. Aspiration in these respects appears to have the advantage over intercostal incision, but there are so many disturbing factors in the different classes of case that little importance can be attached to such relative figures. It is of greater value to attempt to indicate which operation is the more suitable in individual cases.

Table IV shows the relative frequency of the different operations, with death rate and recovery time.

TABLE IV.—SHOWING RELATIVE FREQUENCY OF DIFFERENT OPERATIONS.

Operations.	Number.	Deaths Among Class II. Patients.	Average Time in Hospital after Operation.
Aspiration	27	5 (20%)	26 days
Aspiration and intercostal incision .. .	12	2 (17%)	47 days
Aspiration and rib resection .. .	30	6 (20%)	67 days
Aspiration and intercostal incision and rib resection .. .	2		
Intercostal incision .. .	45	12 (29%)	36 days
Intercostal incision and rib resection .. .	2		38 days
Rib resection .. .	235	40 (18%)	38 days

War surgery experience showed that in empyema due to gunshot wounds the pleura was able to deal with infective organisms in a similar manner to the peritoneum, if after the removal of foreign bodies and necrotic tissue the pleura were closed. Attempts were made to apply this widely to civil empyema by means of aspirations or drainage followed by closure; the attempts met with only a small degree of success, for there is no foreign body comparable to the piece of shell, removal of which destroys the source of the organisms; the lung is the source which persists. However, aspiration alone in quite an appreciable number of my own patients has been sufficient to bring about a cure. There is a class of empyema in which there is only a small amount of pus to be found; here aspiration is most successful, but the difficulty is to recognize this particular class. Then again in infancy, the period of high mortality, aspiration is preferable to rib resection; it may require to be repeated or followed by a thoracotomy when the removal of the mechanical embarrassment of the fluid has left the baby in a better condition. It may also be employed with advantage in bilateral empyema which had a mortality in my series of 72% and in the American Army of 89%; here the embarrassment to respiration by a double pneumo-

thorax is of serious moment and aspiration of one side at least is advisable. Double empyema, said to be rare in adults, was present in 4% of the Children's Hospital cases. Then the American experience of its value in the acute pneumonic stage has been already mentioned.

Many authorities lay down that aspiration is the operation that must be performed in streptococcal empyema, at least until adhesions form; in pneumococcal empyema adhesions are present early and open operation is desirable. Others on the contrary, obtain no help in this way from the bacteriology.

Aspiration should be carried out under a general anæsthetic. Without it the struggles of the child not only exhaust the patient, but render an operation, already far less easy than it sounds, a matter of difficulty and unpleasantness.

Intercostal incision is the general method of operation for which I would put in a strong plea, and it is the routine method I personally favour except in those cases just mentioned in which aspiration is preferable.

The object of operation in empyema is to remove the pus and to permit of its continuance of drainage until the patient's own resistance gains the ascendancy over the organisms and to do so with the minimum of shock and additional embarrassment of respiration. I believe that this can be most readily achieved by intercostal incision, so long as care be taken during after-treatment to prevent premature closing of the wound. Especially is this applicable to infants in whom the operation of rib resection causes so much shock and discomfort in breathing. Even in infants the use of a rib spreader permits of exploration of the pleural cavity with the finger or of visual inspection nearly as readily with intercostal incision as with rib resection. When necessary the operation can be performed in a few seconds, though it is very desirable once the pleura is opened by whatever operation to allow the pus to escape slowly.

Rib resection is an operation requiring a little more time and in the stage of raising the periosteum causing distinct shock. It is I think the most suitable operation when the conditions under which after-treatment will be carried out, are not satisfactory, for interference with drainage is less likely than with intercostal incision.

More complicated operations involving double incisions, formations of skin valves and the use of valves formed by rubber sheeting have been tried and not found to have any advantage over the simple classic operations. With either of these methods of performing thoracotomy I regard the separation of adhesions as unsound; it is doubtful too if much trouble should be taken with the removal of masses of fibrin.

In either operation drainage is necessary, but a great deal of harm can be done if it be not carried out carefully. The tube should not be inserted further than just inside the pleura, nor be so large as to exercise much lateral pressure. Some years ago it used to be the custom in the Children's Hospital to place a T-shaped tube some distance

inside the pleura and tie it there; the abandonment of this method is the only reason I can see for the improvement of results noticed in recent years. A split tube does all that is required. For similar reasons it is wise not to leave the tube in for more than a few days and the gentle passage of a forceps afterwards is usually sufficient to prevent premature closure of the wound. Syphon drainage, apparently so desirable, has been frequently tried and the fact that it has been as frequently abandoned testifies to its value.

Regarding details of operations a general anaesthetic is desirable and local anaesthesia has been rarely employed for some years at the Children's Hospital. In small children in a toxic state it is frequently a most distressing performance and ether anaesthesia is less harmful.

The formerly recommended position in which the patient lies on the affected side or back, is unnecessary; the position of convenience to the surgeon with a bias against too much pronation is preferable.

A great deal has been written as to the most suitable site for operation, but it seems to be a matter of little import. Where pus is found by the needle is the place to drain the chest. If possible it is desirable to avoid the back, as the wound becomes irritated by lying on it; in addition the wound is better well clear of the diaphragm, as there is a tendency for the costo-diaphragmatic space to be occluded by adhesions. In this regard it must be remembered that an opening as high as the seventh interspace in the mid-axillary line has entered the peritoneum—an occasional accident that seems more alarming than dangerous.

After-Treatment.

The chief thing to do in after-treatment is to place the child in the open air, feed him up, amuse him and interfere with him as little as possible. Irrigation of the wound in the early stage whether with saline solution or Dakin's fluid is not well borne by small children. A comparison of 1,100 cases by the Empyema Commission of the United States Army shows no proof of quicker healing with Dakin irrigations than by simple drainage, though the Commission recommends it. The wound if closing prematurely must be kept open with great gentleness. Periods of rise in temperature before and after the wound has closed are frequent and worrying, but in most cases no further collection of pus is disclosed and convalescence continues.

Blowing bottles is probably harmless, but of little value, as it is changes in the lung or thickened visceral pleura or adhesions that prevent the approximation of lung and chest wall. An exercise which merely causes increased intrathoracic pressure cannot be expected to influence such conditions. What is of more value is the practice of deep inspiration.

The proportion of empyemata that become sufficiently chronic to require operation, is surprisingly low in the histories I have examined and it is gratifying, in examining patients a year or more after discharge from hospital, to find how very few show

any recognizable signs of damage to the lungs or of diminished function.

Before entering on any operative treatment of chronic empyemata a trial should be made of irrigation with Dakin's fluid; this frequently causes the cavity to close by action on the fibrous tissue around the cavity. When operation is required, the extent of the cavity should first be ascertained by X ray examination after injection of a solution of one of the opaque sodium salts. It is necessary to remember that the shock of an Estlander's operation is very great in children and care should be taken to remove too few ribs rather than too many. Sometimes after the surgeon has stopped operation on account of the patient's condition before he considers he has removed enough ribs, he is gratified to find that closure of the cavity takes place and no further operation is necessary. The shock of decortication in children is so great that it should not be carried out, if a thoracoplasty can be made in any way to produce the desired result.

Acknowledgments.

In conclusion I have to express my thanks to my colleagues at the Children's Hospital who have permitted me to utilize their case histories; to Dr. David Brown who has made extracts of a large number of the histories, and to Miss Roth who has gone to much trouble in hunting out these histories.

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TREATMENT OF EMPYEMA IN ADULTS.¹

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WITH the exception of the treatment of empyema by aspiration which was advocated after the war, there has been little new work published for years and this paper is in no way original, but is based on the results of work done in civil practice during the past six years.

Aspiration.

The treatment of empyema by aspiration has been in my hands and in those cases in which I have had the opportunity of observing the results of others, an unqualified failure from the point of view of curing the patient; as a preliminary method of treatment in some cases of streptococcal empyema it has its distinct application, but only for a few days till the medical attendant is confident the abscess cavity is walled off and the mediastinum more or less fixed. There is a distinct difference

¹ Read at a meeting of the Victorian Branch of the British Medical Association on June 1, 1927.

between the empyema dependent on extensive pulmonary disease, the primary inflammatory condition of which is still active with the result that the pleura is repeatedly reinfected over a large area, and the localized injury to the thorax seen in war wounds where the damaged tissues can be removed and the normal pleura elsewhere can by its own reaction aided by aspiration in a large number of cases limit the spread of the inflammation. With an extensive primary pulmonary condition I think aspiration except in isolated instances is doomed to failure and, persisted in, will result only in that combined medical and surgical tragedy "the chronic empyema."

Thoracotomy and Drainage.

If aspiration then is a failure, the only remaining treatment is thoracotomy and drainage and the only questions that are at issue are when and where to drain. These two factors are influenced by: (i) The stage of the primary condition when the empyema is diagnosed; (ii) the nature of the infecting organism in the empyema.

Mr. Downes has stated his experience in children of empyema occurring at the height of the pneumonia. So far as adults are concerned, while I will admit there is fluid in the pleura during the height of a lobar pneumonia, it must be very seldom indeed that a true empyema is present at the height of the lobar pneumonia on that side. It is true that there may be an empyema on the side first involved and an active pneumonic condition on the other side. I have not met the former, in the latter I have delayed operation for a few days by aspirating, but I would not delay more than a few days. With a bronchopneumonia it may be different and empyemata will be seen with the pulmonary condition still active but not such a massive involvement as in a lobar pneumonia. With those exceptions and the former must in adults be very rare, all empyemata due to the action of the pneumococcus, characterized by thick creamy pus in the absence under some circumstances of bacteriological investigation, should be drained as soon as diagnosed. The contents of the pleural cavity in the early stages of a streptococcal empyema are very fluid, there is little fibrin deposited for the first few days, little walling off of the empyema cavity occurs and the patient can be severely shocked by thoracotomy even when performed with local anaesthesia presumably because of the instability of the mediastinum. I consider that in the presence of very fluid pus it is wise to wait for a few days and in the interval only in the presence of gross compression of the lung is aspiration necessary. The type of case in which this problem is encountered, is the puerperal septicaemia with bronchopneumonia and empyema sometimes bilateral. Anyone who has opened and drained such pleural cavities with the empyema contents not much thicker than pleural fluid, although streptococci are present in numbers, must have seen some patients considerably the worse immediately for the methods adopted. In all such cases I would consider delay for a few days only, possibly combined with aspiration and in those patients who

recover from the septicaemia, the lung will usually expand and that quickly, as can be checked with X rays. In these circumstances there is not the thick deposit of fibrin to become organized on the visceral pleura and bind it down.

The second problem is where to operate. That will necessarily be determined by the site of the empyema, but as most such are in the dependent portion of the pleura and as the patient is in bed, the only way in which the abscess cavity can be drained at its lowest limit so as to leave no pool below the level of the drain tube, is to be practically on the diaphragmatic level and to resect the rib as far back as its angle. The angle of the rib is the most posterior portion of the thoracic cavity and unless the resection is performed there, the desired posterior dependent drainage can be obtained in no other way. This makes the resection with a local anaesthetic a little more difficult, because the ribs lie at a deeper level and the muscular attachments are much more tendinous and it is more difficult to separate them. The resection should include the tenth rib in the region of its angle and in no circumstances should the point of resection be higher than the ninth rib. For the resection to be at the angle the centre of the skin incision should be in line with the vertebral border of the scapula with the arm at the side, not with the arm across the side of the table; that will take you to the posterior axillary line for the rib resection. I know there are some who will say that this opening is too low, that the diaphragm will block the opening and so on, but the further back the opening is made, the less likely is the tube to be blocked. The risks run are two: (i) to drain too low and for the drain tube or the resulting sinus to be closed too quickly by the diaphragm and for a collection above to result or (ii) to drain too high and for a chronic empyema to result. I have quite recently had one experience of the former trouble—a secondary collection above—and it was very easily dealt with and I much prefer to deal with such a collection than to deal with a chronic empyema. I have had no experience of a chronic empyema developing since using this method of drainage.

The interlobular empyema can usually be easily reached if it is the lower portion of the interlobar fissure by excising portion of the fourth rib in the axilla.

An empyema in the upper portion of the interlobar fissure is difficult of approach because of the scapula and may have to be approached between the vertebral border of the scapula and the spine, the arm being thrown well forward. This is in my experience the most difficult empyema to approach. Such empyemata are rare, but will from time to time be encountered.

Anaesthesia.

There is only one method of anaesthesia which should be chosen—local anaesthesia. Use a 0.5% to 1% solution of "Novocaine" and, unless you wish to quarrel with some of the physicians, omit the adrenalin usually used because of its possible action on the blood pressure adding an extra load to a toxic

myocardium. Inject the area over the rib to be resected and then inject under the rib to be removed and certainly under the rib above in the region of the angle. No special needles are required, a fair sized "Record" needle, feeling for the lower border of the rib as you inject in advance of the needle, if passed obliquely upwards, is much easier to manage than the curved needle pictured in the books and the thoracotomy is and should be painless. Slow decompression with a finger in the opening and removal of all lymph and a drainage tube to, but not inches into the cavity, with one or two silkworm gut sutures complete the operation.

Recent Methods of Anæsthesia.

A combination of nitrous oxide and oxygen is, I think, not to be compared with local anæsthesia because of the rather forced respiration usually associated with such anæsthesia. In view of the pulmonary condition all inhalation anæsthesia must surely, except in very simple cases, be contra-indicated.

After Treatment and Chronic Empyema.

The after treatment consists of blowing Woolf's bottles with the sound side held. The drain tubes are removed in about four days and a long sinus forceps is passed into the cavity daily, opened and withdrawn. Although for a few days the patient is best turned towards the side involved, that should not be carried out to the extent of preventing that side functioning.

I have never considered that the size of the opening in the thorax relative to the glottis is of any material importance from the aspects of the expansion of the lung and have never used any of the valved drain tubes which have been described.

If all patients with empyema were successfully treated, of course there would be no cases of chronic empyema and no prolonged convalescence. Without wearying you with figures it will be instructive to consider the number of patients with chronic empyema treated at the Melbourne Hospital over a period of about three years and the number of patients with empyema in hospital longer than two months.

They are as follows:

Total of case records examined	103
Chronic empyemata	14
Patients in longer than eight weeks after operation	20
Mortality	21
Patients with tubercle bacilli in the sputum..	3

I regret that as pathological examination is incomplete no accurate figures can be given in regard to the incidence of pneumococcal empyema as compared with streptococcal or the type of pneumococcus responsible.

It is difficult from the meagre notes too often found in hospital records to analyse the causes of failure, but my own case records show that the almost routine use of a local anæsthetic has eliminated any anxiety on that account. They also show that posterior dependent drainage has resulted in

no patients with chronic empyema requiring extensive secondary operation. This form of drainage, however, has necessitated in two cases the opening of a secondary collection above the drainage sinus, in one case through the sinus with the finger, in the more recent through a separate incision with rib resection.

The results in chronic empyema were varied. Several patients were discharged still draining without any accurate detail as to whether they were improved or not. Three died, one from lardaceous disease and two from cerebral abscesses.

Only five of the fourteen were cured on discharge.

The treatment of chronic empyemata must be left to the judgement of the individual surgeon as to whether he will remove the visceral pleura or collapse the thoracic wall or do both. These procedures are attended with considerable danger in a necessarily poor operative risk which however must be faced. To collapse the thoracic wall efficiently in an extensive case you must resect the angle of the rib or the thorax will not collapse sufficiently and you may be forced to carry out the procedure in stages.

Osteomyelitis of the ribs with discharging sinus sometimes running a long course are not as a rule difficult to deal with, if followed over their complete course; otherwise like any other sinus they will not heal.

Most monographs from England and America refer to bronchial fistula and tuberculous infected empyema cavities. I have kept a close watch for both these complications and have never seen a bronchial fistula in civil work and in one hundred and three cases at the Melbourne Hospital only twice was there a suspicion even that one was present and then the fistula was not definitely demonstrated or dealt with. I have seen patients with extensive tuberculosis develop empyema, but in no case that I have had to deal with has tuberculous infection of the empyema cavity been the cause of the development of a chronic empyema. Possibly others will state a different experience as tuberculous infection of an empyema cavity appears to be fairly common in some countries and possibly those seeing much late and extensive tuberculous disease of the lung, meet it.

Actinomycosis as the cause of a chronic empyema I have only once seen and the empyema that develops in association with malignant disease of the mediastinum, for example the œsophagus, is only a small if terminal incident in the disease.

There is a hopeless outlook for patients with cerebral abscesses. I have not seen one give a ray of hope, the abscesses are nearly always multiple with diffuse suppuration.

I have said nothing specific about the empyema that follows a bronchopneumonia occurring some few days after operation and not apparently dependent on the anæsthesia. If the pulmonary complication is post-anæsthetic and follows more quickly, the later form is almost unquestionably embolic and its treatment calls for no special comment.

This paper was to discuss the treatment of empyema and not its diagnosis, but it may not be out of place to say that the exploration of a chest with the aid of a local anæsthetic can be painless, except for the initial hypodermic prick and so fear of hurting the patient can be no excuse for the use of too small a needle. The pus is often thick and the exploring needle must be large or the empyema will be missed.

Result After Thoracotomy and Drainage.

Very often, especially following lobar pneumonia, there will be a dramatic fall in temperature and pulse and improvement in general condition so that there is little anxiety concerning the result, but with wandering bronchopneumonia or small pulmonary abscesses there may be little immediate improvement, although the empyema has been efficiently drained.

X ray and clinical signs will determine whether there is any loculation or whether the pulmonary form is still active or other complications have developed. Recently I opened and drained an empyema which had without doubt been present for about three weeks, which responded to drainage perfectly as regards local signs and healing, but the temperature and pulse remained high and the patient sweated almost as badly each night for three weeks after the operation as he had done before. We were all worried lest a loculus had been left behind of which there was absolutely no evidence, then he coughed up about one deserts spoonful only of pure pus and all the symptoms subsided. The physician in charge of the patient considered it to be a small pulmonary abscess evacuated, but it is always a worry trying to determine the cause in any condition that does not quickly improve. Is the empyema inefficiently drained or is the lung still active? If available, X ray examination unquestionably helps most and a catheter or probe in the sinus will determine the site of secondary collections.

Bilateral empyemata are not common. In the hundred and three cases recorded there was only one such and the patient was admitted under my care. The two empyemata were opened and drained as they developed and were diagnosed at an interval of eight days and the patient did quite well.

Conclusion.

The treatment of many surgical conditions varies considerably in different clinics and it often happens that different men will obtain equally good results using different methods. This is seen all through medicine and surgery and the personal care bestowed on each individual patient counts both as regards the end result and the stay in hospital. The way in which the sinus is kept open, supervision of the exercises to expand the lungs all count, but in my hands the methods of treatment outlined above have given the best results. I am not claiming that all patients with empyemata will be out of hospital in two or three weeks if treated this way, because for them to be out of hospital in four weeks is a good result, but, treated in this way, I think chronic empyemata will result very seldom.

ZINC IONIZATION IN OPHTHALMIC WORK

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IN zinc ionization or iontophoresis we have a very potent therapeutic weapon which is not known or used as much as it should be. While in Edinburgh in 1911, I went to two lectures on the subject and learned something about it. I obtained a zinc electrode and used it in a desultory fashion, chiefly in trachoma. But it was not until 1914, when it was again brought under my notice by the late C. S. Hawkes, of Brisbane, that I realized its value in corneal ulcers. I am also indebted to H. M. Traquair, of Edinburgh, for much valuable information on the subject contained in a reprint which he kindly sent me, but which I have unfortunately mislaid.

It is only during the last six or seven years that I have explored its possibilities with vigour. The occasion which started me seriously on this track was a somewhat dramatic one. A boy was seen at the Children's Hospital with a fulminating pneumococcal corneal ulcer. I saw this early, though it occupied a quarter of the area of the cornea at the centre. I applied carbolic acid and the actual cautery. Next day I repeated this and did a paracentesis. I saw it daily, but in spite of all I could do it spread like a bush fire and the process came to an end only when I made a Guthrie's corneal section. Nearly all the cornea became opaque.

A week later I saw a patient with a similar condition at the same hospital; it was also pneumococcal. This time I took up my ionization outfit and zinc-ionized the ulcer thoroughly, without using the cautery. Next day the floor of the ulcer was silvery and free from pus and it healed without further spread. The sight was lost, it is true, because the ulcer was central and large when first seen. But I was impressed by the difference in behaviour under the two methods of treatment.

Since then I have never been without the means of giving ionization at my rooms or at my hospitals. Its success is most striking in corneal lesions, but it is of great value in infected or suspicious perforating wounds of the cornea and limbus. A case in point is that of a boy who had had a central jagged corneal rupture from a blow of a stick eighteen hours earlier. No atropine had been used and the iris was adherent to the back of the wound and drawn to the centre. The edges of the wound were grey and infiltrated and there was hypopion. All the conditions favourable to a panophthalmitis or a sympathetic inflammation were present. I ionized the whole area, deeming it inadvisable to open the wound and deal with the iris in the presence of infection. Next day the hypopion had disappeared, all signs of infection cleared up and the eye recovered rapidly. Later I did an iridectomy. As a routine measure in such eye injuries I now

ionize the whole area thoroughly before excising a prolapse of iris.

In blepharitis—eczema of the lid margins—I have had very good results, but better in the dry type than in the ulcerative and best of all when the eczema is associated with a chronic Morax-Axenfeld conjunctivitis. In some such cases the change from red rims to healthy lids is so startling that patients come back for more.

In trachoma, in that type without much papillary hypertrophy, where the object of treatment is only to provoke reaction and leucocytosis, zinc is as effective and more controllable than silver nitrate.

In pustular (phlyctenular) conjunctivitis and keratitis and in that mysterious lesion met with in adults near the limbus, of a heaping up of the sub-conjunctival tissues, with much superficial injection, and which I imagine must be analogous pathologically to a "blind" boil, I have found zinc ionization of great benefit.

So that, while in corneal infections this method is a "sovereign" remedy and one without which I should feel sadly handicapped, there are probably many other avenues for its employment that will occur to a rational mind apart from those which I have enumerated. It is obvious that if we can find a method of driving a drug deeply into the tissues, we must have a better chance of favourably influencing them than by the instillation at intervals of a weak watery solution, much of which is probably and promptly both diluted and washed away by the tears.

To come to details, a battery of two or three dry cells in a box is needed with a very finely-wound rheostat. Interposed in the circuit is a milliammeter. This should be in such a position that it can be read easily by the operator. The zinc electrode is a short length of chemically pure zinc wire which can be supplied by any firm of electricians. The wire is mounted in a holder such as is used for electrolysis. It is attached to the positive pole, since zinc is a kation, having a strong affinity for the negative pole. To the negative pole is attached the indifferent electrode, a plate of metal, lead or pewter, with about twenty folds of towel moistened with saline solution between it and the skin. While the current is flowing, zinc ions are strongly drawn through the tissues towards the negative pole.

In treating the cornea it is most important that not more than half a milliamperè be used and that for not more than from one to two or three seconds. Otherwise severe neuralgia is caused which lasts several hours and the subsequent pain is in direct proportion to the length and strength of the exposure. However, hot fomentations and a sedative powder will relieve this. Unless I desire a cauterant effect, which in a definitely septic and deep ulcer may be necessary, as a matter of routine I twist round the zinc wire a very thin layer of absorbent cotton and dip this at intervals in a 1% solution of zinc sulphate. The ulcer should first be cleaned of *débris* by using the covered electrode as a swab and the surface is then treated with a freshly

mounted wire. The conjunctival sac must always be washed out with saline solution after treatment, as with the tears zinc chloride will be produced which is irritating.

In treating parts other than the cornea, I use as much as two milliampères and prolong the exposure to several minutes. In *eczema marginalis*, for instance, I clean up the eyelash roots with a covered and soaked electrode, using it like a brush and then use a clean-mounted wire.

I am so convinced that in this method we have a very potent addition to our armoury that I am impelled to offer these very sketchy notes for the consideration of my colleagues.

THE CANCER OUTLOOK.

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MALIGNANT disease is receiving more attention today than at any time in the history of medicine. Much has been done and much is being done in advancing our knowledge of this most interesting but distressing disease, yet much remains to be done before it can be claimed that scientists have that knowledge and mastery of the condition such as has been attained in diphtheria, enteric fever *et cetera*.

The Nature of Cancer.

All are familiar with the works of Cohnheim, Ribbert and von Hansemann, but their theories are not now accepted although von Hansemann's anaplasia theory is somewhat similar to that of Broder's⁽¹⁾ whose recent articles on the cytological grouping or grading of malignant disease under four headings is the most recognized standard today.

Gye⁽²⁾ has done a vast amount of study on cancer and his latest publication was by some acknowledged as the last word on malignant disease and it was thought by many that a specific, though ultramicroscopic, organism had been discovered and that this organism was in part at least the cause of cancer. Gye's combination of the chemical and biological theories is the most ingenious and fascinating study that anyone interested in the cancer problem can possibly read and his laboratory experimental work has been most extensive. Gye's work has been before the scientific world for some time now and has been subject to much criticism, a great deal of it destructive. There are some weak links that require strengthening and there are many gaps apparently unbridgeable.

The whole of the experimental work was done with that really rare tumour known as the Rous tumour and which occurs only amongst the Plymouth Rock fowl and, although he was able to reproduce this tumour *ab initio* and by transplantation, yet there is much doubt as to whether this tumour, though it does metastasize, is not after all an infective granuloma.

Other workers have been unable to reduplicate some of Gye's experiments and are not prepared to acknowledge the presence of an organism.

Had Gye done the same experiments with an epithelial tumour and obtained the same results, then I think the theory would have rested on a more solid foundation. As it is, the most or least one can do with our present state of knowledge on this subject is to render the Scotch verdict "Not proven." However, my opinion is that, if the workers in the field of malignant disease are to arrive at definite conclusions, sarcomata and carcinomata will have to be treated as separate entities and it is more than possible that not only are the Rous tumours but all sarcomata due to some specific, but as yet unidentified microorganisms.

Most pathologists hold that malignant disease is a disease of the cells themselves and in no way due to a specific organism. They view it as an aimless irresistible growth of regenerative cells that, owing to outside influences such as injuries and continued irritations, have failed to differentiate and, growing abnormally, end in cancer.

Blair Bell⁽³⁾ holds that cancer is a differentiation of highly specialized cells. His theory is based on the hypothesis that malignant neoplasia is a specific growth process on the part of a cell reduced to starvation by any irritating means, mechanical, chemical, radiological *et cetera* and then to live it reverts to the embryonic type of trophoblast cell seeking nutriment in any possible manner and growing in the way of the chorion epithelium. Bell, by the way, looks upon this as a true malignant neoplasm controlled only by the biological hormone which terminates pregnancy and which in those rare cases where the control is lost or never existed, becomes a chorion epithelioma.

A work less known perhaps than many others, but one that in my opinion will go farther than anything at present before us in solving the human cancer problem, is that of Maud Slye,⁽⁴⁾ of Chicago. She has for the last twenty years been working on the inheritability of cancer in mice. In her laboratory where I was privileged to spend some hours, are thousands of mice with which she conducts her experiments, and on each of which when it dies a *post mortem* examination is held and the pathology of its organs recorded by others besides herself. By proper mating of these mice she is able to get results that completely observe Mendel's laws and she can produce cancer or at least a susceptibility to cancer at will. Moreover, she is able to produce the type of cancer she requires and, when she mates hybrids, the results observe absolutely the Mendelian ratio of dominant, hybrid and recessive.

Her experiments show that heredity is the most important factor in the appearance of cancer in mice and there is no reason to doubt that, if the same conditions were applied in man, the results would be the same. Application of the same conditions in man is impossible, but if, as Maud Slye suggests, records such as she indicates were kept in all hospitals where malignant disease is treated, a very valuable guide to heredity in humans would

be obtained. Human mating is indiscriminate, but when hybrids of cancer stock do mate then cancer will appear in the offspring.

Every experienced surgeon has seen three or more cancers occurring in one family and there is no doubt in my mind that, if we were able to trace these families back, we would then find that cancer existed on both sides.

The heritability of cancer has a very important bearing on insurance proposals and, if insurance referees acknowledge it, then their views on acceptance or loading of proposals will have to undergo alterations and a history of cancer in the parents of any proponent will suggest either non-acceptance or a loading.

Suggestions that malignant disease is due to some type of blood disease have been definitely disposed of by the fact that so many patients have been cured permanently by surgical procedure, an impossibility if the condition were due to blood disease.

Summary.

To sum up the position as it appears today:

1. In some people there is a cancer strain or susceptibility inherited from ancestors perhaps three or four or more generations back.
2. In these people some injury causes a destruction of cells and, if the irritation causing the destruction is continued, regenerative processes become abnormal, cell differentiation lessens or ceases entirely and the undifferentiated cells, left to their own devices, become a malignant neoplasm.
3. It is possible that the alterations in the mechanism of differentiation are due in some cases to the introduction of microorganisms into cells whose resistance to infection has been decreased by continued irritation.

Diagnosis.

Before the subject of treatment is entered, a few words in early diagnosis are not out of place.

Early diagnosis means the microscopical examination of a suspicious tumour, so that, if good results are to be obtained, the growth might be removed while still local.

Most pathologists are now able to tell within a few minutes by examination of a frozen section whether a growth is malignant or not, but advanced pathologists go much further than this. Terry is now bringing before the profession a stain by the aid of which he can in ten seconds after receiving a specimen say whether it is malignant or not. Sections are cut with an ordinary razor and do not require freezing. MacCarty⁽⁵⁾ can tell from microscopical examination of two or three cells, say, from the uterine scraping, if there is a new growth in the uterus. Having examined so many specimens, he is able to do this, but he is not able to tell others exactly how he does it, but, as he says, it is possible to recognize friends at sight, but not to tell others how to do it.

If surgeons and others who treat cancers, are to expect good results, the pathologists must be placed

in such a position that they can make a certain rapid diagnosis.

Treatment.

Although the exact cause of malignant disease has not yet been discovered, there should be no slackening in our efforts to cure or to palliate with means already at our disposal existing conditions. It is over fifty years since Pasteur was able to establish an immunity in rabies, yet the cause is still in doubt. It is over forty years since Koch discovered the tubercle bacillus, still, there is no specific cure for this disease. Moreover, it is hardly to be expected that a certain absolute cure for cancer or for that matter for any other chronic disease will ever be discovered, especially as cancer, like arteriosclerosis, is for the most part a disease of advancing years and one wonders, even were it possible, would it be desirable by the aid of sera *et cetera* to attain the state that Tithonus did, when for the asking he was granted immortality, but without the disadvantages of old age, and for ever afterwards roamed, a white haired spectre, the ever silent spaces of the East!

Prevention.

There is very little doubt that in some humans, as in some mice, an inherited susceptibility to cancer exists and, until some test is devised to prove that any given person is of the dominant cancer resistant type, it will be necessary for all to avoid continued irritations and, if they do exist, to get rid of them at the earliest opportunity.

Serum.

Many attempts have been made to treat cancer with serum and toxins.

Coley had obtained results in some sarcomata by using a fluid containing the toxins of the erysipelas streptococcus and *Bacillus prodigiosus*, but, as I said in a previous paper, the cures were probably due to the high temperature produced rather than to any specific action of the toxins.

The products of crushed cancer cells or those treated by X rays and injected into the cancer subject have never yet produced beneficial results and cases are on record in which the victim has been burdened with a massive new growth at the point of inoculation owing to the fact that some of the cells have escaped crushing or that the X rays failed to destroy completely a portion of the injected material.

Lumsden⁽⁶⁾ has experimentally cured new growths in rats by the use of serum, but until a great number of cures have been reported, it will be unwise to ascribe cures in malignant disease to serum when it is known that in a certain class of malignant disease a certain number have spontaneously retrogressed and apparently been cured.

As our knowledge is at present, the only known methods of successfully treating malignant diseases are surgery, application of low grade heat, radiation and perhaps in a very limited number of inoperable cancers colloidal lead.

Surgery.

Wherever surgery is possible it should be practised and this view is generally adopted all over the world and there are a great many highly skilled radiologists who will not attempt to treat a patient with malignant disease wherever an operation is likely to be effective. This view has the support of such authorities as Carter Wood,⁽⁷⁾ of New York, who does not practise surgery, and Bloodgood,⁽⁸⁾ of Baltimore.

There is one condition in which surgery should never be attempted, that is the lymphosarcoma.

In all operable malignant disease wide removal, but not necessarily mutilation, is required. End results, however, should never be sacrificed for cosmetic effects. Whilst on this point it is wise to consider whether, when glands at some distance from the primary growth are involved, for example those above the clavicle in cancer of the breast, operation is advisable. Opinions on this are divided, but there is a feeling in some clinics that operations have of recent times been too extensive and it is held that, when these conditions arise, deep organs are already affected and the cure is impossible. The writer's belief, however, is that even if only one in twenty of the apparently hopeless patients might be cured by wide dissection, then it should be done even if the surgeon's reputation and vital statistics suffer thereby. Even if the operation is not successful as a cure, it will not materially shorten the life of the already doomed patient. The patients in these circumstances should be always informed of the immediate dangers of the extensive operation.

Again, even if a cure cannot be expected, there are some conditions, such as the inoperable squamous celled epitheliomata of the tongue, floor of the mouth and cheek with infected lymphatic glands in the neck, in which the primary growth can be held by the applications of radium. In these it is well known that radiation has no effect on the glands, but, if they are removed by a carefully planned dissection, then the patient will probably live for years in comparative comfort and be able to transact essential business and, when death does supervene, it will be less painful.

Operations should not be performed when experience has shown that, on account of the early distribution of cancer cells such as in epithelioma of the *cervix uteri*, any surgical measure planned to remove the whole of the cancer cells must destroy vital structures.

I am firmly convinced that all cancers of the *cervix uteri* should be treated by low grade heat or, if the surgeon is not able to or prepared to use the heated iron, then radium should be applied, for any cancer of the cervix that can be cured by cutting, can be cured by the hot iron or radium applied properly and in sufficient dosage and either of these methods, if the condition is incurable, will alleviate suffering and prolong life more than any cutting operation.

Before leaving the subject of operation it is advisable to refer to the application of other methods

in conjunction with or subsequent to operation. Take a cancer of the breast, even if the axillary glands do not appear to be involved, yet they are always removed. Now in these cases, no matter how carefully the axilla is dissected with the cold knife or cleaned with gauze, microscopical and even macroscopical pieces of fat with lymphatics will be left and in these particles cancer cells are liable to exist.

If the surgeon has not felt competent to dissect the axilla with the Percy cautery, there is nothing to prevent his using the hot iron. This will destroy any cancer cells with which it comes in contact, and the hot melted fat running over will destroy any malignant cells without seriously damaging the structures on which they lie. The application of a solution of zinc chloride, as used by Strobell and others has a similar effect. Details such as these, as in other operations, make the difference between success and failure.

Many surgeons advise the use of X rays three weeks or so after operation in varying doses and good results are claimed. This is, however, a method of treatment the results of which cannot be proved. There are tumours such as a certain number of testicular tumours in which large metastatic abdominal masses have disappeared and remained absent for years under X ray treatment, when the main growth has been removed by surgical operation.

I have already referred to the treatment of the squamous called epitheliomata of the mouth *et cetera* by the combined application of radium and surgery.

X Rays and Radium.

The application of X rays has a definite place in the treatment of cancer, but the claims made in the past have in the light of more recent experience, proved to be somewhat exaggerated or the results misunderstood. It is wasted effort to treat a cancer by X rays when complete removal is possible.

There is no doubt that some cancers have been cured by X rays alone, but in nearly all the cure could have been more surely effected by surgery.

There is one exception and that is lymphosarcoma. Surgery has never effected a cure in this condition and X rays have some ten year cures to their credit and many such growths have been held in check for varying periods.

There has been much discussion as to whether X rays have direct action on cancer cells or whether the results have been due to specific immunity action.

Murphy irradiated malignant growths and then transplanted them and they grew, but, when he irradiated an ordinary healthy rat and transplanted a malignant growth into it, the growth did not take. This suggested the production of a specific immunity in the body of the rat against cancer, but the transplants did not die and the condition was probably due to a lowering of the vitality in the rat, such as occurs in any illness and it is a well-known fact that grafts do not take well when the vitality of the recipient has been lowered.

The real condition in the treatment of cancer by X rays is that malignant cells have a lesser degree of resistance to destructive agents of any kind than normal tissues and the greater the degree of malignancy, the less the degree of resistance.

Neoplasms that respond rapidly to irradiation are intensely malignant.

X rays destroy in some cancers all the malignant cells, but very often the deeper cells are not destroyed, but are only stunned and are then surrounded by fibrous tissue which encapsulates them. It has, however, been repeatedly proved by section and microscopical examination that they remain alive and also when these supposedly cured areas have been incised the whole disease starts again, as the cancer cells have been freed by the cutting.

The relief of symptoms and apparent and sometimes real cures justify the use of X rays in inoperable cancers wherever application is possible. Results are dependent on the degree of penetration and distant cancer cells are often destroyed or so seriously stunned that the fibrosis following the treatment prohibits their further growth, whilst the functions of the highly differentiated cells of the affected organs are still unimpaired.

X rays have so far never been found effective in the treatment of malignant disease in the intestinal tract or abdominal organs except the rectum. Good results have often been obtained in malignant disease of the pelvic organs and in secondary abdominal masses. The amount of X rays used is, however, limited by the dose the small intestine will tolerate and this is about 135% of an erythema dose, taking 100% as what the skin will stand with slight radiations.

For secondaries in the liver a dose that might do any good, would be fatal to the small intestine.

Applications of X rays have been advised by many previous to operation, but if any operation is likely to be curative, it must be complete. X rays cannot help, but they might do harm by devitalizing the healthy tissues rendering the operation more difficult and making healing difficult.

Radium.

Radium therapy has not fulfilled the early expectations. This is due in a great measure to the too early and over enthusiastic reports on what was then a limited number of cases. Now that it has been used for a number of years and the results have been carefully studied, more definite conclusions can be arrived at. Radium, as is the case with X rays, should never be the chosen method in the treatment of cancer if an operation is possible, but in properly selected cancers such as cancer of the cervix it has a very definite therapeutic value.

The Radium Institute of London, the Howard Kelly Hospital of Baltimore, the Memorial Hospital, New York, and many other institutes where radium is used extensively, have records of numbers of patients cured by radium and the records of patients whose cancer has been held in check for years and whose symptoms have been relieved, go into thousands.

Burnam showed me a patient treated ten years ago with radium for cancer of the larynx and still remaining quite well.

As previously stated, the action of radium on cancer depends on the radiosensitivity of the cancer cells, but this radiosensitivity, even in given tumours, is variable, some elements being highly sensitive and some highly resistant.

Carter Wood states that 90% of basal celled tumours of the skin are radiosensitive in that radium will cure them, but about 10% of these tumours contain squamous epithelium and require very large doses to effect a cure, so the conclusion is formed that even basal celled tumours should be burnt out or cut out wherever possible.

There are many patients with cancer of the rectum whose condition does not warrant operation and yet, following the proper implantation of radium tubes, they have remained well for years.

Radium needles, heavily filtered and properly applied, may be left in for days in tonsillar growths and good results follow.

Melano-fascial, neurogenic and most bone sarcomata are uninfluenced by radium.

Primary cancer of the lung is never affected by X rays.

In most institutes radium emanations are used, but, wherever radium is going to be adopted as a method of treatment, not less than two hundred milligrammes are required and to treat any malignant growth with insufficient supplies of radium and expect good results, is like expecting results following the use of a curette.

Diathermy as a method of treatment is practised to some extent everywhere and in the Mayo Clinic malignant tumours of the bladder that are irremovable, have been treated by this method for the last three years with fair results, radium never being used in these conditions now.

Colloidal Lead.

Many years ago Blair Bell noticed that women working in lead, if they became pregnant, nearly always aborted. Bell then experimented with rabbits and he found that if a pregnant rabbit were given a sufficient quantity of lead, it aborted as did the human female and the abortion was caused by the actual poisoning of the placental structures which under the microscope were found to be necrotic. Working along these lines, Bell and his coworkers were able to prove that both placental and malignant cells have a higher phosphatide content than ordinary cells and that this phosphatide has a special selective affinity for lead. Reasoning from this he introduced lead intravenously into the body of a cancer patient, hoping that owing to the excess of phosphatide in the malignant cells lead sufficient to destroy them would be absorbed, but that sufficient would not be absorbed by the rest of the body to form a lethal dose. In this he was to an extent successful, as witness the number of hopeless patients treated by this method alive and well today.

Observations of a similar nature to this have been made before, including those of Keyser who

found that selenium amongst other metals was a poison to cancer cells. He tried to make it more selective by combining it with eosin; however, this was found to be ineffective and this method of treatment has been abandoned.

The lead treatment of cancer has been tried by many others, but few have obtained results similar to Bell and too often in their cases the lethal dose for the cancer was found to be the lethal dose for the patient.

Martland and von Sochocky⁽¹⁰⁾ experimented with a series of cases with what they called a more stable colloid of lead and all their patients died. This, however, is nothing against the administration of lead, for not only did they not give the same preparation, but they did not give the dosage advised by Bell.

Carter Wood has tried this method of treatment in rat cancers and, although he noted some improvement in the rats, he has so far not effected a cure. He advises the combination of X rays and lead treatment.

It is not every patient with inoperable carcinoma that can have lead treatment and there are many contraindications to its use. For instance, squamous celled epithelioma of the tongue, lip or cheek does not respond to treatment, but the more vascular rapidly growing tumours respond more readily to it. Cachectic patients and those with real inefficiency should not be given it nor should those with cerebral lesions.

Bell advises that gross masses should be removed before any treatment with lead is begun.

The method of preparation of colloidal lead is comparatively simple, but lead is a powerful toxic drug and it should be used only in those inoperable cases that do not have any contraindication, and then it should be used only in hospitals where the patients can be carefully watched.

To conclude, lead treatment of cancer, as with all other methods of treating this disease, should be practised only by those who are specially trained in its or their uses. Unskilful use of treatment only brings the treatment adopted into disrepute.

Quackery.

A few remarks may be made about persons, some of whom are foolish and others most pernicious and who require some drastic action on the part of the Government to protect the unfortunate victims of malignant disease. The first includes those zealous but misguided enthusiasts who without any knowledge of anatomy, pathology or allied sciences are prepared to fill volumes with words without wisdom. They proclaim how they have prevented themselves and others from developing cancer by returning to normal methods of living, not knowing that animals and even fishes whose habits of living have never varied, suffer from cancers and they are forgetful of the fact that they themselves are not even dead yet.

We can look benevolently on the poor humbug whose method of treatment is often as poor as

his knowledge of the English language. but there is nothing too bad to say of the second class, that lowest type of human, the quack, occasionally qualified, who with his sera and what not and promises is prepared to snatch the last penny from the hand of the dying but hopeful patient. This degraded monster is often aided by a certain type of lay press which, while still protesting its undying devotion for the public weal, is prepared for small monetary gains to print the quack's lying propaganda.

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Reports of Cases.

HYDATID OF THE LUNG: SPONTANEOUS PNEUMOTHORAX.

By GUY GRIFFITHS, M.D.,
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H.H., a male, aged twenty-two years, a labourer who had never worked among sheep, was admitted to the Royal North Shore Hospital of Sydney on December 13, 1925. He had been operated on for appendicitis in 1922 and had made a good recovery.

In 1923 he had pleurisy with effusion and had never been very well since, remaining weak and liable to coughs and colds.

Three days before admission he was much worse with severe cough, very copious, frothy, yellow-green sputum, dyspnoea, pain in the left side and night sweats.

On admission he was thin and looked ill, his pulse rate was 132, his temperature 39.6° C. (103.4° F.) and his respirations numbered 28 in the minute. There was very little excursion of the left chest, the breath sounds were feeble over the upper part of the left lung and at the base there were friction rub, dullness and absence of breath sounds; over the right upper lobe the breath sounds were harsh. The case notes leave the position of the cardiac apex beat doubtful. One medical officer afterwards recollected it as on the right side, another on the left in the fifth space and just within the nipple line. The abdomen was carinated.

On December 21 he said he felt better, but the cardiac impulse was palpable on the right side of the chest just within the nipple line and a skiagram showed a complete left pneumothorax.

He had very copious purulent sputum one hundred to three hundred cubic centimetres daily, but on six separate examinations no tubercle bacilli were found but only pneumococci and a few streptococci. A surgeon saw him and advised operation, but the patient demurred.

Till January 10, 1926, he made a little progress, but the dullness of the left base increased; his chest was aspirated and one hundred cubic centimetres of thick shreddy pus were withdrawn; in this were found neutrophiles, few lymphocytes and pneumococci, but no tubercle bacilli. Two days later the apex beat had returned to the left, two and a half centimetres (one inch) within the nipple line, some respiratory movement could be seen on the left side and a skiagram revealed pleurisy with effusion; the fever had gradually decreased and on January 14 it ceased. Seven further examinations of the sputum were made for tubercle bacilli, but none were found. He still had some dullness at the left base.

In February he was tested with albumose-free tuberculin, 0.001 cubic centimetres on February 1, 0.005 on February 3 and 0.012 on February 5; there was no slightest sign of reaction.

On February 8, 1926, his apex beat was in the left nipple line, the movement of the left chest remained less than that of the right, there was slight dullness at the left base with friction rub above it and towards the left apex anteriorly feeble tubular breathing. He felt well and asked to go home.

On November 15, 1926, nine months later, he was readmitted. He had had recurring hæmoptysis for two months culminating this day in one of nine hundred cubic centimetres (a pint and a half). He was submitted to cautious examination; the left side moved much less than the right; he had no appetite, his pulse rate was 120, his respirations numbered 28, his temperature was 38.3° C. (101° F.). This last became normal in two days and he did well for a fortnight, but then the temperature rose again to 38.3° C. and more, the apex beat was outside the left nipple line, there was increasing dullness at the left base with feeble and then absent breath sounds and the signs were still more intense in the left subaxilla.

On December 8 four explorations were made with a large hypodermic needle, but nothing was found. On December 11 there were vomiting, epistaxis and movable dullness at the left base. I aspirated and got nothing. Dr. Doak kindly saw the patient and suspected pus, but advised waiting. On December 14 a skiagram showed the whole left side of the chest to be opaque, suggesting pleurisy with effusion, but an honorary radiographer considered there would be no advantage in examining him with the screen.

On December 23 the dullness had increased still further and a physician who saw him in consultation, thought his condition tuberculous, despite the repeated failures to find tubercle bacilli and the absence of the tuberculin reaction.

On December 29 there was copious expectoration with fragments of hydatid cyst wall; the respirations were usually 24 to 28 in the minute and the hectic fever continued. There had been little sputum for six weeks before this; what was now obtained from day to day was examined but no tubercle bacilli, no hydatid elements, no elastic fibres were found.

On January 7, 1927, Dr. H. R. Sear reported that the whole of the left side of the chest was opaque from fluid and showed nothing else.

The patient's blood gave the hydatid complement fixation reaction and Casoni's reaction.

On January 13 Dr. Doak incised high up in the left anterior axillary line and evacuated 300 or 400 cubic centimetres of pus and some cyst wall showing the typical hydatid lamination and put in a drainage tube.

He did well for a week and then had several rigors with temperature as high as 40.8° C. (105.4° F.) due to temporary blockage of drainage, but was always relieved by the insertion of sinus forceps.

By February 23 his wound had closed, the fever had ceased and he was doing very well, but still had a little

dulness and tubular breathing at the left apex. He left hospital weighing 47.7 kilograms (seven stone eight pounds).

On May 25 he reappeared very well and fit, weighing 62.5 kilograms (nine stone thirteen pounds). The left side of the chest lagged a little in expansion, but no other abnormal pulmonary signs were found. The scar which at first had restricted raising the left arm no longer did so.

Comment.

Similar cases are so rare as to seem well worthy of record. According to Dr. Anderson (*The British Medical Journal*, April 23, 1927, page 760) they amount to only some thirty-five, most of them collected by the great authority on hydatid disease, Professor F. Dévé, of Rouen.

This case presents several features of interest: First, the remarkable simulation of phthisis, so well known in pulmonary echinococcus, but always astonishing in each new case; second, the failure of the sputum examination for months; third, the failure of exploratory puncture; fourth, the failure of radiography; fifth, the usefulness of tuberculin; the failure of the reaction excluded tuberculosis with certainty, but nevertheless did not convince the experienced physician who was called in consultation; sixth, the spontaneous pneumothorax; seventh, the remission; eighth, the relapse; ninth, the septic infection presumably through a bronchus; tenth, the surgical cure achieved by an operation which the honorary surgeon described as quite simple and for which I am indeed grateful.

PSEUDO-HERMAPHRODITISM.

By A. E. COATES, M.D., M.S.,

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THE following case is sufficiently rare to be of anatomical interest.

A male, aged fifty-five years, died from chronic nephritis and uræmia and his body was brought to the dissecting room. The examination before dissection revealed a complete cleft in the scrotum which consisted of two halves roofed over by the cranial wall of the perineal urethra.



FIGURE I.

Showing External Genital Organs, Seen from the Ventral Aspect. A patent *processus vaginalis* is seen on each side above and below on each side is a labium containing a testis.



FIGURE II.

Showing Perineal Aspect of External Genital Organs. Below is the anus and above is the penis. The two "labia" are seen between.

The cleft thus formed communicated anteriorly with the penile urethra and posteriorly with a normal posterior urethra. A sound was passed along the penile urethra and met with no obstruction passing through the cleft and thence into the bladder.

After dissection each half of the scrotum or labium, as it might be termed, was found to contain a flattened testis and a patent *processus vaginalis peritonei* in which was enclosed a spindle-shaped hernia of omentum. The other contents of the hemiscrotum were normal. A sagittal section showed a prostate of normal size, but the prostatic utricle was abnormally large and presented a definite cavity in the posterior part of the gland.



FIGURE III.

Sagittal Section Through the Pelvis.

The perineal body was of normal size. The dissection of the seminal vesicles and *vas deferens* revealed no abnormality. No trace of rudimentary uterine tubes or ovaries could be found. The findings on histological examination of a section of the testes differed in no way from those of the normal gland. Microscopical examination of the lining of the prostatic utricle revealed the typical columnar epithelium. The prostate was microscopically normal. The lining of the cleft in the scrotum was squamous epithelium.

The breasts were represented by large masses of fat, much larger than those of the ordinary male, but there was an almost complete absence of mammary tissue. The general contour of the body and distribution of hair resembled the female type. No family history could be obtained, so that there was no evidence of procreative activities.

Inquiry into the life history of the man disclosed the following. He was a married man, a butcher by trade and



FIGURE IV.
Showing Prostate and Prostatic Utricle in
Sagittal Section.

of a very retiring disposition, having a shrill voice and seldom shaving the face owing to the very slow growth of the beard.

In a search of the literature no record of a case exactly like this could be found. It was undoubtedly a male, but the interest lies in the fact that the cleft in the perineum resembled a true vulva and yet the penis was well developed, unlike the usual rudimentary organ seen in these cases of pseudo-hermaphroditism. The enlargement of the prostatic utricle, forming a rudimentary uterus, was also an interesting feature.

The reason for the condition was faulty union of the genital folds, and that error remained confined to the perineal region, the genital tubercles having formed a normal penis. The bilateral patency of the *processus vaginalis peritonei* and the contained hernia were but another example of arrest of development in a neighbouring region. The accompanying figures serve to illustrate the condition found from all its aspects.

Reviews.

THE HEALTH OF SCHOOL CHILDREN.

"THE hygiene of the growing age as a scientific study is more important nationally than any other."

It is with these words that Dr. James Kerr, Consulting Medical Officer of the London County Council, begins the preface to his great work, "The Fundamentals of School Health."¹

In this book are to be found marshalled by a master mind the observation, experience and deductions of a lifetime spent in studying the young, growing human animal between the ages of two and sixteen years. Not personal knowledge alone, however, has been drawn upon, but also that gained by the study of innumerable reports by medical officers of schools all over the world and of much other literature dealing with the health of children. As a result the children of many lands are compared and contrasted with those of Great Britain among whom the author's work was carried out.

The views of American, French and German writers are constantly referred to, while Australian observers, such as Berry and Harvey Sutton, who have respectively made definite contributions to our knowledge of mental defect and standards of nutrition, are cited in detail.

The kinds of work done by medical officers of schools is but little understood not only by the lay public, but even by many medical practitioners. It would be impossible for any one who glanced over the topics here dealt with, not to realize how many-sided is the knowledge required and how varied the subjects which demand attention. Heredity, physique, games and play, nutrition, dental hygiene, light treatment, open-air schools, intelligence, sex education, vision, hearing, speech, school buildings and grounds and many other topics have chapters devoted to them. To the consideration of each Dr. Kerr brings the wisdom gained in thirty crowded years of experience and has valuable advice to offer.

It is difficult to choose, among so much that is excellent, special features for mention, but from the point of view of the future the chapter upon the preschool child is the most arresting.

The plea made for attention to this as yet neglected period will be echoed by every intelligent reader. In Australia the community is quite as oblivious of the importance of this truly "dangerous age" as are the people of Great Britain and this in spite of the fact that it is between the ages of two and six years that so many children fall victims to the zymotic diseases and their sequelæ and to dental caries. In all schools a proportion of entrants are found more or less permanently damaged by these diseases when examined for the first time by the medical officer.

The subject of dental caries and its prevention is very fully discussed. Dr. Kerr advocates that it can only be by the employment of trained dental hygienists as distinct from fully trained dentists that the massive problem of dental disease among school children can be successfully treated now and for a long time to come. When the thousands of children in primary schools, the vast majority of whom (90% in many schools) need dental attention, is considered, it will surely be conceded that the necessary number of fully trained dentists to treat them would take too long to train and be too costly to maintain. In New Zealand the school medical officers are unanimous in stating that since the advent of dental nurses the improvement in dental hygiene has been great. The nurses' teachings as well as their actual work have resulted in greater attention being paid to the teeth of parents and older brothers and sisters, as well as to those of the school children. Dr. Kerr suggests that the training might be even shorter than that given in New Zealand, one year instead of two. He contends that the necessary skill can be acquired in the shorter period and since the

¹"The Fundamentals of School Health," by James Kerr, M.A., M.D., D.P.H.; 1926. London: George Allen and Unwin Limited. Crown 4to., pp. 874, with illustrations. Price: 35s. net.

problem is urgent, the sooner a remedy is available, the better.

The discussion upon rickets is exceedingly interesting. That the personal equation of the observer is a large factor in determining its presence or absence is undoubtedly true. Were knock-knees alone accepted as an indication, an attitude adopted by some observers, nearly half the children seen in schools would be rachitic. Such a standard is untenable, but children with mild rickets as evidenced by slight rosaries and the presence of many carious and frequently malformed teeth, are often seen. There is here a field for research as yet untouched, but owing to numerical insufficiency of the school medical officers in Australia, the time and the facilities for the indispensable examination by X rays cannot be obtained.

Rheumatism and heart disease receive much attention. Cardiac conditions in children and their prognosis immediate and remote present many difficulties, particularly such as are of a functional nature. A number of children are seen in whom the examiner has difficulty in assessing the importance of a poor myocardial tone. Dr. Kerr holds rightly that the condition is often due to insufficient rest, especially insufficient sleep. The evils of excessive cycle riding are commented upon. It is a type of exercise over which parents exercise little supervision, yet it is undoubtedly prejudicial to rapidly growing boys, except in moderation.

The importance to the children both directly and indirectly of the health of their teachers, its importance to the teachers themselves, to education departments and to the community generally is adequately dealt with. In more than one of the Australian States insufficient attention is given to this problem by the education authorities, with much resultant loss of efficiency.

A protest is also made against the totally inadequate time given to the study of hygiene in the training of teachers.

"The healthy animal should be the first aim of State education," says Dr. Kerr, but how can that aim be attained when those responsible for so large a part of the training imparted to it are themselves so ignorant of the laws of health?

In some States hygiene and music are not compulsory subjects in the student-teacher's curriculum. As a result, although the lectures are attended, serious study is not given to them since certificates are awarded regardless of the marks gained. No two subjects surely are so important in a child's life and through it in the life of the community as are these. To know and to practise the laws of healthy living are more essential by far than to know the situation of Africa or the events of the Victorian era, if a choice must be made. To love music and to make it are to develop one of the greatest aids to happiness and therefore one of the surest aids to health that man can know.

A few slight grammatical errors, due probably to careless proof reading, mar a sentence here and there. They will doubtless be corrected in a later edition.

The book may be described as a classic, one which will prove a mine of wealth to all medical officers of schools, public health and education authorities and to those interested in the health of the community. As a work of reference it will long remain unsurpassed.

It should be upon the shelves of every school medical and education library and particularly upon those of every department of public health. Did our parliamentary representatives really desire the greatest good of their electors, they would read and act upon much of the advice given, for until adequate care is taken in the earliest years of life, no nation can be truly healthy, truly great, but for such care money is needed and it is only through the best and wisest administration of public funds that it can be found.

VACCINATION.

In England nearly four million children under twelve years of age are legally exempted from vaccination and unprotected against smallpox. A very interesting study

of the queer mob psychology which has led to this state of affairs is contained in a little book, "Should We Be Vaccinated?"¹ The author is Lecturer in Sociology at Columbia University and undertook this work which is really a history of the vaccination controversy as part of the larger study of the factors which are constantly manifested in opposition to social change. He could have chosen no better example, for the normal attitude of the scientific man of today, when he views the flood of anti-vaccinationist literature poured out year after year, is one of amazement and no little bewilderment. To all such this small book will be a great help. It consists of a brief history of vaccination and the shifting bases of the opposition shown to it and at its conclusion a summary of the factors which have formed and maintained that opposition. Between the lines glimpses may be obtained of the personalities of the protagonists, the fanatics Jenner and Ring, the cautious Pearson and Woodville, those egregious asses Benjamin Mosely and Rowley and so down to our own George Bernard Shaw.

The book purports to be non-partisan, but as no scientific man can write on the subject without the verdict showing clear on every page, the reader can see the professed antivaccinationist who has perhaps been captured by the title, depositing the volume after a hasty perusal in the waste paper basket. He will gain little comfort from its study.

The author has made a little slip in his dates on page 86, which might be pardoned, but for the fact that it is repeated on page 139. Apart from this the book is singularly free from errors and misstatements, is readable and in parts quite entertaining.

AN ATLAS OF SKIN DISEASES.

HENRY MACCORMAC presents the Fourth English Edition of the well-known "Jacobi's Atlas of Dermochromes" with an entirely new and original text.²

This Atlas, also known as the Jacobi-Pringle Atlas, is in two volumes, containing 322 coloured illustrations and two half-tone figures. The plates are excellently reproduced in natural tints by a four colour process and each plate is accompanied by a short explanatory text containing practical points in aetiology, diagnosis, prognosis and treatment.

There is an alphabetical list of plates to each volume in addition to a complete index to the two volumes at the end of the second one.

The plates are as nearly perfect as is possible in reproducing the different, difficult and often minute lesions which occur in skin diseases. Special care has been taken to see that the detail is correct and to achieve this many authorities on dermatology have been consulted, in particular Dr. J. H. Sequeira, Dr. J. M. MacLeod and Dr. J. Darier. The author too is the pupil of and successor to the celebrated Dr. Pringle who was the originator of this fine atlas.

There is much space given to syphilis, in fact there are no less than thirty-nine plates devoted to this aspect of dermatology. Skin lesions of infectious diseases have also been included and are illustrated by splendid coloured plates.

It is pleasing to see such a fine example of colour printing and the more so in that it is a British production. Not only does Dr. MacCormac deserve credit for this excellent work which can be recommended as the skin atlas above all others worth having, but also a word of praise is due to the publishers.

¹ "Should We Be Vaccinated? A Survey of the Controversy in its Historical and Scientific Aspects," by Bernhard J. Stern; 1927. New York: Harper and Brothers. Post 8vo., pp. 146. Price: \$1.50 net.

² "Jacobi's Atlas of Dermochromes with Entirely New and Original Text," by Henry MacCormac, C.B.E., M.D., F.R.C.P.; Fourth Edition; in Two Volumes; 1926. London: William Hlenemann (Medical Books), Limited. Imperial 8vo., pp. 205, with illustrations. Price: £5 5s. the set.

The Medical Journal of Australia

SATURDAY, JULY 23, 1927.

Spahlinger.

IN August, 1925, the Government of New South Wales commissioned Dr. McIntyre Sinclair to investigate the serum and vaccine treatment of Henri Spahlinger in Geneva. A report on the results of his findings was laid on the table of the Legislative Assembly of New South Wales in November, 1926. Although Dr. Sinclair exercised the greatest care in weighing the evidence on which his conclusions are based, it is unfortunate that he allowed himself to judge the physiological effects of the serum on some thirty patients said to have been treated by this serum without having had any first hand experience and without being able to apply the crucial test of the immunizing value of Spahlinger's alleged remedy. Dr. Sinclair holds that this man has succeeded in producing an antitoxic serum when others have failed. The challenge could be thrown out as to whether a toxin elaborated from tubercle bacilli has been isolated. Without such a toxin it is impossible to establish the existence of a specific antitoxin.

In order to evaluate Spahlinger's treatment and to test the justification for his claims, it is necessary to marshal all the available facts and to keep these facts quite distinct from opinions and impressions. Spahlinger's treatment has been mentioned in these columns on a few occasions. Many competent scientists have claimed that they have discovered sera and other forms of specific treatment of tuberculosis and all have failed to substantiate their claims. Again much harm has been done by certain medical practitioners and non-medical persons who have made similar claims in spite of the fact that they have lacked the bacteriological knowledge and laboratory experience essential for work of this kind. Koch's *Alt Tuberkulin* and *Bazillen Emulsion* remain today the nearest approach to specific remedies for tuberculosis. It is true that there are many variants of

these tuberculins, but it is doubtful whether any are more effective than the original vaccines.

The first matter to be examined in connexion with a treatment introduced by a non-medical person is the competency of the originator. Henri Spahlinger is a lawyer. According to Dr. O. Leuch, junior, editor of the *Schweizerische Ärztezeitung für Standesfragen*, he owns an elaborate serological laboratory where his remedies are produced. Professor Sahli, of Berne (*Daily Express*, January 27, 1927) has stated that he knew Spahlinger many years before when he claimed that he had discovered an infallible serum for the treatment of enteric fever. He appeared at that time to be a person completely ignorant of medicine. Apparently the typhoid fever serum has been dropped. We can discover no information concerning Spahlinger's training as a bacteriologist. He works with an English architect, named R. Goulbourne Lovell, who seems to look after the business side of Spahlinger's undertakings, but, if some of the statements made by patients can be accepted, he does not correct anyone who addresses him as Dr. Lovell. He is said to feel patients' pulses, to examine skiagrams and to discuss prognosis with patients or patients' friends. Spahlinger further seems to have some business arrangement with Dr. Theodore Stephani, who owns a sanatorium at Montana. Dr. Stephani is an elderly practitioner and his Swiss colleagues do not regard him as an authority. It is significant that Professor Naegeli and Professor Sahli have stated that the treatment is not used in Switzerland. The medical profession in that country has refused to be trapped by impudent claims of an untrained person who declines to allow his assertions to be tested by independent scientific workers. Moreover, many Swiss clinicians of high standing maintain that they have examined patients whose condition has been unfavourably influenced by the treatment. It would therefore appear that the evidence adduced by Spahlinger and his intimates cannot be accepted unless it is corroborated by competent observers.

The newspaper campaigns in Australia and England in favour of Spahlinger have been built up on the claims that the originator is an altruist, with such an intense love for human nature that he has

spent a fortune on his investigations and expects patients to assist him financially in carrying out his work. He objects to the suggestion that they pay fees for treatment. He or those acting on his behalf have appealed for very large sums of money to enable him to manufacture a sufficient supply of vaccine and serum and to get rid of his financial liabilities. An investigation conducted by the *Daily Express* early this year revealed that the laboratories at Carouge do not differ from other laboratories in regard to the cost of upkeep. We have it on excellent authority that nearly every patient admitted to the institute "donates" at least £500; very few pay less, while many have paid much more. It has been estimated that there were about forty patients in the institute in January, 1927, and that thirty passed through in 1926. Apart from these donations of £500 apiece, there have been many very substantial gifts to Spahlinger and his institute ranging from £22,000 downwards. Patients who cannot or will not pay £500 or other substantial sum, are advised to go to Montana either to Dr. Stephani's sanatorium or to a *Pension*. They were told that the serum was very scarce, that Spahlinger was working under great difficulties and that serum would be sent as soon as it was available. It also appears from the information available to us that some form of serum was available at all times for the patients admitted to the institute. The statement is published in the *Daily Express* of January 26, 1927, that "enough money has come to the institute to provide great resources for research and the production of serum and vaccine."

It will be remembered that in response to the newspaper propaganda and the appeal for financial assistance, four offers were made to help Spahlinger. The first was from Professor Calmette, the well known Assistant-Director of the Pasteur Institute in Paris. Spahlinger visited the Pasteur Institute in 1920 and asked Professor Calmette to take an interest in his researches. Professor Calmette said that he was prepared to carry out an experimental investigation in conjunction with Monsieur Spahlinger. The conditions were that the experiments should be conducted in the Pasteur Institute. Some should be performed by Monsieur Spahlinger in the presence of Professor Calmette and some should

be carried out by Professor Calmette in the presence of Monsieur Spahlinger. The animals to be used in the experiments were to be kept in a special room to which only Monsieur Spahlinger and Professor Calmette should have access. Spahlinger replied that he did not feel quite ready for an experimental test, but that he would think over the proposal. He did not communicate again with Professor Calmette or the Pasteur Institute. That was seven years ago.

The second offer was from the British Red Cross Society. This society signed an undertaking to pay Spahlinger £10,000 at once and a further sum of £10,000 after twelve months, together with four Swiss francs for every ampoule of vaccine or serum supplied. The investigation was to be carried out under ordinary conditions of control. The Red Cross Society insisted on a clause entitling the principal medical officer of the society to visit the laboratory from time to time to watch the progress of the work. This offer was refused.

The New South Wales Government offered to send a bacteriologist and four patients to Geneva, if Spahlinger would agree to treat them. This offer was refused and Spahlinger declined to mention a sum of money necessary to enable him to treat the four patients satisfactorily.

Mr. Thomas Baker, of Melbourne, offered Spahlinger a large sum of money if he would allow an Australian bacteriologist to work for two years at his institute. This offer was also refused. Various other proposals have been made, but Spahlinger persists in keeping the manufacture of his remedies secret and in preventing the manufacture of them by a scientific institution or commercial firm apart from his control. It appears that Spahlinger also refused to carry out a clinical test of his remedies at the Cantonal Hospital, Geneva.

Very little seems to be known of the experimental work on which Spahlinger bases his claims. It has been stated that he repeated some of his guinea pig experiments in the presence of a Swiss general practitioner. We are unaware whether or not this practitioner had any previous laboratory training. His name is unknown in the world of bacteriologists. Similarly the nature of the supervision of certain

experiments with cattle in 1926 would seem to be doubtful. A claim was made that this test was carried out under "strict official supervision." We are informed on good authority that no supervised investigation was carried out by any Swiss public authority. In these circumstances the nature of Spahlinger's remedies is still unknown. The vaccine seems to be something like *Bazillen Emulsion*. This supposition is supported by Dr. McIntyre Sinclair and has previously been made in these columns. In regard to the sera, the matter is complicated by the claim of numerous variations; Spahlinger speaks of his complete sera and of at least twenty-two partial sera. There is an entire absence of any scientific evidence of the production of antitoxin serum. The onus of proof is on Spahlinger and he refuses to give sufficient information to enable the world of science to test it.

It thus becomes necessary to turn to the clinical aspect of the question, although every clinician will admit that clinical tests are likely to be misleading and unsatisfactory until a remedy has been employed in a large number of patients. It so happens that the architect Lovell has written a book. This was a disastrous thing to do. In his book he has ventured to set out some statistical evidence of the cures effected by the remedies. We have in our possession reports from patients and relatives of defunct patients from which we can gather that failure to cure must be very common. More than that. Many of the patients have been seriously damaged by Spahlinger's treatment. There is a pathetic cry from some to warn other victims of the dire disease tuberculosis from travelling from Australia to Geneva to waste their money, to experience bitter disappointment and to die far away from those whom they love and can trust.

Lovell claims that no less than four hundred and eighty-nine patients have been treated and that 74% have recovered. He has divided the patients into five groups. It appears that Dr. Stephani has treated two hundred and ninety-four patients between 1915 and 1920. It has been shown that many of these patients were Russian prisoners of war who had been subjected to hardships and privations. The subsequent history of these and many other patients is unknown. The evidence concerning this

group cannot be accepted. In a group of thirty-five patients treated by ten different practitioners, fourteen are entered as having died; one is said to have had tuberculous meningitis and one aneurysm of the aorta. Among those included among the recoveries were two entered in the list of unknown and one known to have died in 1924 or 1925. The patient said to have had an aneurysm of the aorta was examined in England a few months before his death. The skiagram revealed clearly that he had no aneurysm. He died of a pulmonary hæmorrhage. In another group several of the entries are misleading. It seems that many of the patients referred to by Lovell as having recovered, had given up the Spahlinger treatment after a reasonable trial either without benefit or when the condition had become distinctly worse. The claim of 74% of recoveries cannot be substantiated. On the contrary, the evidence available reveals that the patients did badly as a rule after serum treatment.

There have been many claims in regard to cures for tuberculosis. Some have been worthy of serious investigation. Spahlinger's does not belong to this class. It is remotely possible that he has discovered something, but the unreliable nature of the statements made by him and those associated with him and the extortionate method adopted by this Swiss notary indicate that he is playing a game of bluff. England and Australia have supplied him with much money and many victims. The people of other countries are wiser and more circumspect. The time has come to utter the final word about Spahlinger and his impudent claim. As far as we are concerned, we have said it.

Current Comment.

TRANSACTIONS OF CONGRESS.

OWING to circumstances over which we have had no control the publication of the Transactions of the second session of the Australasian Medical Congress (British Medical Association), Dunedin, 1927, has been delayed. The first instalment will appear in a supplement to THE MEDICAL JOURNAL OF AUSTRALIA of July 30, 1927. It is proposed to issue supplements of thirty-two pages of reading matter each week. Members are advised to preserve their copies each week, in order that they may be bound into one volume on completion. Bound sets can be supplied, provided that the order is placed before July 25, 1927.

Abstracts from Current Medical Literature.

THERAPEUTICS.

Enteric Fever.

M. L. TRESTON (*Indian Medical Gazette*, October, 1926) considers that typhoid-paratyphoid A and B vaccine is of great value in the treatment of enteric fever. In one hundred and fifty-one cases of the disease among patients in all stages beyond the seventh day there were no deaths, while in one hundred and thirty-nine the course of the fever was curtailed. The vaccine was administered at the earliest possible moment after the diagnosis of the disease (usually between the eighth and the fourteenth day). With fresh vaccine (under one year old) the initial dose was 0.12 mil (two minims) and this was increased by 0.06 mil every alternate day until a maximum hypodermic dosage of 0.6 mil (ten minims) was attained. When employing a vaccine over one year old, the author used somewhat larger doses. He considers that the treatment may be adopted at any stage of the disease.

Sodium Bicarbonate in Diabetes.

R. S. HUBBARD AND F. R. WRIGHT (*Clifton Medical Bulletin*, June, 1926) report an experiment in which sodium bicarbonate was administered to an arthritic subject with a resulting increased production and excretion of acetone. A diet containing equal amounts of fat, protein and carbohydrate was given and the acetone excretion noted. Sodium bicarbonate was then given daily in three doses of 1.2 grammes (twenty grains) for one week. A definite increase in acetone excretion occurred. The alkali was then suspended and acetone excretion fell, to rise again when alkali administration was resumed. The triglyceril ester of margaric acid—a synthetic fat known as intarim, was administered to the same patient in place of part of the fat in his diet and a decrease in the rate of excretion of acetone bodies was noted. This agrees with the experiments of Kahn who found that this fat caused a diminution in the excretion of acetone bodies in diabetic subjects.

Measles.

W. T. BENSON AND J. D. H. LAWRIE (*Edinburgh Medical Journal*, April, 1927) record some researches in the seroprophylaxis of measles. Two hundred to three hundred cubic centimetres of blood were obtained from each of two adult measles convalescents seven to ten days after the temperature became normal. The Wassermann test was applied and no reaction obtained. The blood was clotted, the serum pipetted off and tested for sterility and then kept on ice. Oxyquinolin sulphate (chinosol) 0.3 gramme to five hundred cubic centimetres of blood is recommended as a preservative if the serum is to be

kept long. It is said to retain its immunizing value for six months. Ten cubic centimetres of this serum were injected intramuscularly in eleven children, aged one to five and fifteen cubic centimetres into one child aged eight. These twelve children had been exposed to intimate contact with measles patients for two to four days when the injections were made. Only one of these children subsequently suffered from mild measles. Of eight children who did not receive convalescent serum, two suffered from typical measles.

Iodine Therapy.

F. B. UTLEY (*The Atlantic Medical Journal*, December, 1926) discusses iodine therapy in diseases of the thyroid gland. All thyroid affections may be considered due to iodine deficiency directly or indirectly. The normal gland contains 0.2% to 0.6% of iodine; if this falls below 0.1% thyroid enlargement begins. Iodine is useful in treatment of all goitres except adenomata associated with thyrotoxicosis. Adenomata in childhood may be dissipated by iodine therapy. The maximum dose for adults is ten milligrammes a day for not longer than one month; for children ten milligrammes a week. In severe exophthalmic goitre one hundred to two hundred milligrammes may be given for a day or two, but continued large doses tend to increase or cause thyrotoxicosis. In exophthalmic goitre, if symptoms persist after careful treatment with iodine, thyroidectomy is indicated. At puberty and during pregnancy thyroid enlargements respond quickly to iodine treatment. Preparations used with their iodine content are: Lugol's solution (12.6%), potassium iodide (76.4%), sodium iodide (84.6%), syrup of ferric iodide (6%), syrup of hydriodic acid (1%). "Iodo-storin" tablets contain ten milligrammes of iodine in each tablet.

Xanthine Diuretics.

H. M. MARIM (*Journal of the American Medical Association*, December 18, 1926) discusses the value of the xanthine group of diuretics in congestive heart failure. Seventy-seven patients with oedema due to heart failure were studied; full doses of digitalis leaf were given and if the oedema failed to disappear entirely other diuretics were used. Theobromine sodium salicylate (2.6 to 5.3 grammes) was given every day for five days, theobromine in gelatine capsules (0.6 gramme) or synthetic theophylline (theocin) (0.3 gramme) was given thrice daily for two days. Rheumatic or arteriosclerotic heart disease (or hypertension) was the basis of the heart failure in all cases. The renal condition of patients with the latter condition was studied and none was included in whom nephritis was thought to be the cause of the symptoms or signs present. Thirty-six patients lost their oedema with digitalis alone; of the remaining fifty-one thirteen became free from oedema

by the use of the diuretics mentioned, and ten more partly free from oedema. The majority of those who benefited by diuretics, belonged to the arteriosclerotic or hypertensive group. In the patients with rheumatic heart disease only two benefited by diuretics after digitalis had failed to reduce the oedema. Theophylline was the most potent diuretic, it also caused unpleasant symptoms in nearly all patients and was discontinued several times on account of headache, nausea and vomiting. Theobromine was more effective than theobromine sodium salicylate and caused no unpleasant symptoms. If a diuretic was ineffective, it was not repeated, but if effective, several courses were given in some instances. Theobromine sometimes and theophylline frequently relieved the oedema after theobromine sodium salicylate had failed. The conclusion is that the diuretics mentioned are useful in relieving the oedema of heart failure, especially of the arteriosclerotic-hypertensive type, even when digitalis has failed.

"Luminal" Poisoning.

A. S. JACKSON (*The Journal of the American Medical Association*, February 26, 1927) reports six cases in which a toxic reaction occurred from the use of phenobarbital ("Luminal"). These six cases occurred among five hundred patients treated for nervous exhaustion, insomnia, toxic goitre, psychoses and epilepsy. Symptoms of restlessness, a macular or maculopapular measy rash with itching, fever up to 38.3° C. (101° F.) and nervousness occurred. In two cases the patient took larger doses of "Luminal" to allay the nervousness and aggravated the symptoms. Doses of 0.09 gramme (one and a half grains) for three days were sufficient to cause toxic symptoms in two patients. Withdrawal of the drug was followed by subsidence of the symptoms.

Synthetic Thyroxin.

D. M. LYON AND F. A. REDHEAD (*Edinburgh Medical Journal*, April, 1927) describe the results of administering synthetic thyroxin, prepared by Harington, to two myxoedematous patients. Intravenous injections of four to five milligrammes of thyroxin dissolved in 1.5 cubic centimetres of distilled water containing a drop of normal sodium hydrate were given three times to one patient and four times to the other at intervals of two to four days. An increase of the basal metabolic rate and diuresis were noted, diarrhoea also occurred and a loss of weight. The basal metabolic rate rose from -30 to -6 in one patient and from -45 to +3 in the other. When the thyroxin was discontinued, the condition of the patients soon relapsed. The synthetic thyroxin prepared was identical with the thyroxin which is the active principle of the thyroid gland, and these observations are claimed to be of interest as showing the effect of this pure product. Owing to the recognized value of thyroid gland substance thyroxin is unlikely to replace it in treatment.

NEUROLOGY.

The Influence of Hyperpnœa on Nervous Reflexes.

S. DRAGANESCO (*La Presse Médicale*, October 23, 1926) referring to methods of reinforcing nervous reflexes, of which the manœuvre of Jendrassik in connexion with the knee jerk is perhaps best known, states that similar and even more certain results may be obtained by the preliminary induction of hyperpnœa. Such hyperpnœa is brought about simply by requesting the patient to amplify his breathing as far as he can in force and rate over a period of a few minutes. The most striking observations here recorded are that in a series of cases of tabes, myopathy and polyneuritis certain tendon reflexes, especially the knee jerks, apparently abolished, were found to reappear under the influence of hyperpnœa. Evidently in such cases these reflexes were not wholly abolished; they were "liminal" and the lesion of posterior roots was not so complete as ordinary examination might suggest. Mention is also made of a case of pyramidal tract interference in which a hidden sign of Babinski (dorsiflexion of the great toe) and of one of myopathy in which fibrillary muscular contractions were revealed by the same method.

The Basis of the Parkinsonian Syndrome Following Epidemic Encephalitis.

DOUGLAS MCALPINE (*Brain*, December, 1926) gives an account of the literature dealing with the anatomopathology of postencephalitic Parkinsonism and states that there seems to be a consensus of opinion that the *substantia nigra* is constantly and severely affected and that although a few observers do not ascribe the Parkinsonian syndrome to a lesion of the *substantia nigra*, *per se*, the majority seem to hold this view. It would appear that the *substantia nigra* is connected with centres above and below it, of which the *globus pallidus* is best known. By comparing the distribution of the lesions in the acute stages of the disease with those found in the Parkinsonian syndrome, it would seem that although the inflammatory process is widespread initially, affecting particularly the basal ganglia, subthalamic region and midbrain, yet whatever phase of the disease is considered, it is the midbrain and especially the *substantia nigra* which as a rule bears the brunt of the disease. From a study of eight cases of Parkinsonism it was found that the only group of cells constantly affected was that of the *substantia nigra*. Subacute inflammatory changes were present in all the cases, being specially noticeable in the midbrain. This persistence of the infective process would explain the latent period that may occur in some cases between the initial illness and the onset of Parkinsonism; this presupposes that the *substantia nigra* was little affected in the first instance. The basal ganglia and in particular the *globus pallidus*

showed no noteworthy change. The *locus ceruleus* was affected on one side only in three of the cases, which would suggest that a lesion of the *locus ceruleus* does not induce motor phenomena characteristic of Parkinsonism.

Optic Nystagmus in Cerebral Lesions.

JAMES CHARLES FOX AND GORDON HOLMES (*Brain*, September, 1926) aim at determining whether an absence or modification of optic nystagmus to one side has any value in the localization of cerebral lesions. Their observations cover forty-one cases of cerebral tumour, eighteen of vascular lesion, two of cerebral syphilis and sundry other conditions. It must be understood that optic nystagmus, so-called, is equivalent to that deviation of the eyes familiar to railway passengers. Clinically it can be demonstrated with the help of a rotating drum carrying spaced pictures. A review of the results shows, first, that disturbances of vision as such do not interfere with or abolish optic nystagmus, provided the patient has even the vaguest perception of the figures or lines on the rotating drum. Secondly, concerning the more important matter of localizing value, the authors met grave difficulties, such as gross size and multiplication of lesions. They add, however, that one definite statement at least can be made, namely that a unilateral lesion of the forebrain can disturb lateral optic nystagmus to the opposite only. If the lesion lies in the right hemisphere clockwise rotation of the drum evokes a nystagmus consisting of slow deviations of the eyes to the left and quick jerks to the right, in other words a nystagmus to the right; but anti-clockwise rotation has no effect or produces a less regular or less pronounced nystagmus to the left. Further, they add that to any conclusion they can draw, some of their cases present obvious exceptions. It seems to them, however, that nystagmus to the opposite side is affected when a lesion lies in the supramarginal or angular gyrus, in the adjacent portion of the parietal and temporal lobes, in the posterior end of the second frontal convolution or along a line joining this with the angular gyrus. Their observations consequently tend to support Stenver's hypothesis, that reflex centres for optic nystagmus lie in the occipital lobe and in the second frontal convolution and that these are connected by a reflex path which runs through the white matter of the hemisphere.

Manganese Poisoning.

J. R. CHARLES (*Brain*, March, 1927) reports seven cases of manganese poisoning arising in employees at manganese works. The clinical picture is as follows: In the beginning the patient complains of lack of energy, mental languor and early fatigue on exertion. Emotional instability is another early sign and may express itself by excessive smiling or even hilarious laughter without adequate cause. "When several of

these patients are together they frequently gurgle with apparent amusement." At a later stage the face at rest shows a Parkinsonian mask, although sometimes on this is superimposed a set spastic smile. The voice is almost invariably low in tone and monotonous. There is decided rigidity in all muscles of limbs and trunk. The arms are held to the side and the forearms are slightly flexed. On account of trunk rigidity patients tend to fall like a straight pillar when pushed backwards or forwards. They walk with a stiff gait on a wide base and by reason of a characteristic pedal deformity tread on their metatarsophalangeal joints. Propulsion or lateripulsion may be present, but retropulsion is more frequent, indeed is almost constant in advanced forms of the affection. Tremors of a coarse kind are seen in the head and limbs and are accentuated by fatigue. Cramp in the limbs, specially arising in the calf muscles and after exertion, is an invariable complaint. Salivation may be increased. Night sweats are frequent. The deep reflexes are increased in force. After laying stress on the similarity of the train of symptoms in all his patients, the writer goes on to say that the clinical picture of manganese poisoning closely resembles that of progressive lenticular degeneration. The latter disease is associated with monolobular cirrhosis of the liver and manganese even when injected subcutaneously, induces cirrhosis of the liver. Possibly therefore the normal liver secretes some hormone which acts beneficially on the brain, and the suspension of such secretion may induce specific degeneration. With this in view the writer's method of treating his patients with manganese poisoning was to give them thirty to sixty grammes (one to two ounces) of powdered raw liver in the form of a sandwich every day. None was cured, but some improved under this treatment.

Syndromes of the Anterior Cerebral Artery.

CH. FOIX AND P. HILLEMANT (*L'Encéphale*, April, 1926) supply a careful study of the anatomy of the anterior cerebral artery and of the effects of complete and partial occlusions, illustrated by three pages of photographs and numerous drawings. They point out that this artery provides practically the whole blood supply of the anterior seven-eighths of the *corpus callosum*, as well as the neighbouring part of the *centrum ovale* and of course the frontal cortex. The syndrome resulting from obliteration of the vessel is found in three degrees: (i) A simple crural monoplegia, corresponding with a simple cortico-subcortical lesion, (ii) hemiplegia with decided crural predominance, due to a subcortical lesion penetrating deeply into the *centrum ovale* and (iii) crural monoplegia with left-sided ideomotor apraxia, due to an accompanying extensive lesion of the *corpus callosum*. Four examples are fully reported.

Special Abstract.

SILICOSIS IN SOUTH AFRICAN GOLD MINES.

Dr. W. WATKINS-PITCHFORD, whose work on silicosis has frequently been mentioned in this journal, has made an important contribution to *The Journal of Industrial Hygiene* of April, 1927, on the results of the more important of the researches which have been conducted into the causation and pathology of silicosis as met with in the Transvaal. The Transvaal Medical Bureau, since its inauguration in 1916, has conducted on the average 34,890 examinations every year; has prepared and examined in each year 24,568 radiograms of the chest and has annually carried out 342 *post mortem* examinations of the lungs of deceased mine workers. Silicosis has been produced on the Rand in the course of mining through quartzite (containing 90% to 96% of free silica) in order to reach, remove and crush the bands or reefs of gold-containing conglomerate. This conglomerate contains about 86% of free silica and consists of quartz pebbles embedded in a silicified matrix. The silicosis of the South African gold miner is aetologically identical in all its essentials with tin miners' phthisis, stone cutters' phthisis, potters' rot and grinders' disease. These latter diseases appear to be examples of that form of silicosis known in South Africa as "silico-tuberculosis."

The primary factor in the causation of all these diseases is the entry into the lymph channels of the lung *via* the air vesicles of excessive quantities of particles of crystalloid silica, usually in the form of quartz, sandstone or flint. The size of the silica particles which gain access to the lung tissues, is limited by the capacity of the phagocytic endothelial cells to engulf them and to convey them from the vesicles into the lymph spaces and lymph channels of the lung. It is probable that particles below about 0.25 micron or above ten microns are practically innocuous, since they cannot be removed by phagocytosis. Silica particles which have been carried into the lymphatic system of the lung are specifically harmful in two ways: (i) They eventually become encapsuled in small areas of fibrous tissue and when these areas are very numerous and widely distributed, a certain amount of mechanical interference with the function of the lung results (simple silicosis); (ii) their presence greatly facilitates the multiplication of the tubercle bacillus, if this also gains entry into the lymph spaces (tuberculosis with silicosis). Both these effects of silica are probably chemical in nature; the first is slowly developed during the very gradual solution of the particles, while the second is evidenced without delay. If the particles are of silicate, that is, silica combined with metallic oxides, such as glass, brick or cement, the specific effects of silica are not produced. The mere presence of a few particles of silica dust in the lung, although probably predisposing to pulmonary tuberculosis, is not sufficient to give rise to silicosis, at least in its common and generalized form, but no definite statement can be made as to the degree of abundance of particles which is prerequisite to the development of the familiar disease. That a very large proportion of the men employed for the same periods in similar classes of work have failed to acquire the disease, may be accounted for by one or both of the following suppositions: (i) that they have escaped the tuberculous infection which in their less fortunate fellows is the final excitant of the disease and (ii) that for one reason or another the amounts of dust actually inhaled have been relatively smaller. Despite the non-acquisition of silicosis by the great majority of those who have been exposed to the dust for a long period, it appears that the liability to such acquisition may nevertheless be present in many of the individuals. It was found, for example, that several of the long-service miners who took part in the Great War and who were non-silicotic when they left their work, had acquired the condition when they returned. The agency which converts the liability into a manifestation of the disease in any particular person, is usually a tuberculous infection. The state of the individual thus liable to acquire the disease without inhaling any more silica dust is conveniently referred to as latent silicosis.

Silicosis is recognized in the mine workers of the Rand in one or other of two forms—either as simple silicosis or as tuberculosis with silicosis. Simple silicosis is a condition which in a worker who remains free from overt tuberculous changes, is non-progressive and produces but little effect on health. The typical condition is associated with the presence of numerous, small, inert nodules of dense fibrous tissue, scattered symmetrically and uniformly throughout the parenchyma of both lungs. When these nodules are so abundant as to be closely aggregated, a certain amount of disability may result, the leading features of this disability being shortness of breath on exertion and some tendency to obesity. When the nodules are few and widely separated, their presence can hardly be deemed to constitute a disease and their existence indeed often goes undetected during life. Tuberculosis with silicosis (or "infective" silicosis) is a progressive and very serious disorder. It is associated with the presence in the lungs of nodules of somewhat larger size, unsymmetrically distributed in the two lungs and composed of young connective tissue elements among which the *Bacillus tuberculosis* is harboured; adjacent nodules are frequently aggregated into masses. The condition gives rise to advancing disability and cachexia. From the clinical standpoint and especially in the matter of radiographic appearances, patients suffering from tuberculosis with silicosis fall into two classes: (i) those in whom an apparently simple silicosis has first appeared, and in whom at some later date signs of overt tuberculous changes occur unsymmetrically among the silicotic lesions; as far as the European miners are concerned this is decidedly the larger class and the condition is suitably known as "tuberculo-silicosis"; (ii) those in whom the signs first appearing are those of ordinary pulmonary tuberculosis and in whom the signs of a more or less localized silicosis appear shortly afterwards (or are found *post mortem*) in close association with the tuberculous lesions. This condition which is relatively more prevalent among the native labourers, is known as "silico-tuberculosis." The condition of simple silicosis is unfortunately liable to pass into that of tuberculo-silicosis and this even after several years. The liability of simple silicosis to become overtly tuberculous is mainly dependent upon a continued activity in the lung of those factors which were responsible for producing the original condition; in other words, the major part of the liability to the complication is inherent in the patient from the outset and the influence of subsequent environment is of secondary importance.

The pathological changes which characterize simple silicosis and tuberculosis with silicosis are described. The most satisfactory diagnosis is that which is arrived at when the worker has been under systematic observation for a long period. During this period records of his radiographic appearances, weight, auscultatory signs and circumstances of employment will have been made at intervals of about six months. In addition to this bacteriological examinations of the sputum are undertaken whenever any suspicion arises of his having become overtly tuberculous. It has been of considerable service to record simultaneously the radiographic appearances, the weight and the nature of the employment upon a chart capable of displaying the records in chronological order for ten years. The ordinates of this graph represent a scale of radiographic estimates of the amount of connective tissue throughout the lungs; the abscissæ represent years. Records of weight are charted in the upper part of the scale and in this region a line showing the standard weight year by year for an individual of the same height and age is also traced. The nature of the occupation and the results of sputum and blood tests are recorded at the bottom of the graph in the vertical spaces between the abscissæ. The combined chart is specially serviceable in the routine medical supervision of the miners, since it usually gives a warning, often very pronounced, of the impending appearance of either silicosis or pulmonary tuberculosis. The only signs of value which can be elicited by ordinary clinical examination in simple silicosis, are general diminution of air entry with a thin, high-pitched inspiratory murmur. Associated with this is some loss of elasticity of the chest wall and in cases of long duration a diminished range of expansion; definitely reduced expansion is, however, usually suggestive of the presence of an active tuberculous complication.

The observations to be made from a technically satisfactory radiograph are of paramount importance. The radiographic appearances which characterize simple silicosis, are usually first detectable as a gradual increase of the shadows normally cast by the connective tissue of the lungs. This increase is first noticed in the dendritic shadow in each lung, after which small-meshed reticular shadows appear or become more pronounced throughout both pulmonary areas. The pathognomonic radiographic sign of silicosis appears suddenly and develops to its maximum somewhat rapidly; that is, within a few months. It consists of a uniform and symmetrical mottling of the pulmonary areas, the mottling varying in texture from fine ("miliary") to coarse ("dappled") in different cases. The closeness of the individual spots of shadow varies directly with the amount of silica dust incarcerated in the lung or more correctly with the number of nodular lesions to which the dust has given rise. With the lapse of time the individual shadows which compose the mottling, become larger, less numerous and less closely aggregated. The shadow of the heart also tends to change its shape and to become of the so-called "asthenic" or "vertical" type. This change in the outline of the heart shadow is encountered in cachexias of various origin and is highly characteristic of pulmonary tuberculosis. It is nevertheless frequently found in well advanced simple silicosis which is unassociated with any obvious indications of a tuberculous complication. It is significant of cardiac atrophy from any cause. The condition of tuberculosis with silicosis is diagnosed primarily by the radiograph, assistance being derived from a knowledge of previous records, from the results of sputum examinations and from a careful inspection of the combined chart of radiographic appearances and weight. In tuberculo-silicosis the radiograph shows that the hitherto uniformly mottled pulmonary areas are now marked by the addition of one or more unsymmetrical areas of shadow. In silico-tuberculosis the radiograph will have first disclosed an area of shadow (usually situated toward the apex or extending from the hilus), while the remainder of the field, except for the probable presence of unsymmetrical peribronchial thickening, has been of normal appearance. Around the area of shadow and extending to a variable degree over the pulmonary area on that side, a mottling now appears usually within six months. This mottling is similar to but often coarser and less uniformly distributed than that which characterizes the entire pulmonary areas in simple silicosis.

The Medical Bureau has adopted definite criteria as to what are the characters and what the number of silicotic lesions discovered *post mortem* which will justify the conclusion that the disease known as silicosis is present. These criteria are: (i.) The lesions must be specifically those of silicosis and must be both visible to the unaided eye and palpable to touch; (ii) the lesions must be present in such numbers that on the average at least one will appear in each square five centimetre of the divided lung substance; but silicosis shall be deemed to be present when one or more visible and palpable lesions have formed the starting point of a fatal silico-tuberculosis. The total of all periods of actual employment in underground work prior to the first appearance of silicosis in any particular person is known as the "effective period" for that person. The average effective period has become definitely lengthened of late years, being one hundred and nine months in 1917 and one hundred and twenty-three months in 1923. This may be reasonably attributed to the greatly improved conditions underground with respect to dust. Native workers and European miners are very differently affected by simple silicosis and by simple tuberculosis. In the year 1923 to 1924, for example, simple silicosis was relatively fifty-six times more frequent among the miners, while simple tuberculosis was about three and a half times more prevalent among the native labourers. The relative rarity of simple silicosis among the natives is merely the result of the prevailing shortness of the period of employment. Simple tuberculosis commonly appears in the South African native as pneumonic phthisis or follows the "infantile" type of the disease—acute, with a tendency to generalization and terminating fatally within two or three months.

If called upon to assess the capacity for work of a silicotic, the staff of the Medical Bureau simply records

its opinion under one of the four following headings: (1) "Ordinary work"; (2) "moderate work"; (3) "light work"; (4) "no work at all." The author reviews the efforts made to prevent silicosis which consist of mechanical precautions and medical precautions, and describes the benefits which have resulted from the application of these preventive measures.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held in the Medical Society Hall, East Melbourne, on June 1, 1927, Dr. J. NEWMAN MORRIS, the President, in the chair.

Death of Dr. R. J. Bull.

Dr. J. NEWMAN MORRIS announced to members the death of the late President, Dr. R. J. Bull. He said that Dr. Bull had reached the highest position possible for any member of the Branch. He had largely by his own efforts built up the Bacteriology School of the University of Melbourne to its high state of efficiency. Most of the present members of the Branch had benefited by his teaching and he had also performed many services for the community at large. His kindly advice and assistance had always been freely sought and willingly given to all members of the profession. His loss was an irreparable one and deeply regretted by all. He moved:

That this meeting of the Victorian Branch of the British Medical Association records its deep grief at the death of the President of the Branch, Dr. R. J. Bull, and desires to express its heartfelt sympathy with his widow and children.

Dr. Morris called on Dr. George Howard to support the motion.

Dr. GEORGE HOWARD said that he had passed through the University in prebacteriological times and he had been one of the first to join post-graduate classes in that subject. From a very long association with the late Dr. Bull he could speak very highly of his personal and scientific attainments. His valuable services had always been freely and cheerfully given to all members of the profession. His loss both to the community at large and to the medical profession was very great.

The motion was passed in silence by all members present standing.

Empyema.

Dr. A. V. M. ANDERSON read a paper entitled: "The Medical Aspects of Empyema" (see page 106).

Dr. RUPERT M. DOWNES read a paper entitled: "The Treatment of Empyema in Children" (see page 109).

Dr. ALLAN HAILES read a paper entitled: "The Treatment of Empyema in Adults" (see page 112).

Dr. J. R. WILLIAMS said that there was not much to add to what had already been said by the previous speakers. He desired to emphasize the importance in cases of empyema of removing the drain tube within three or four days. If this were not done, there was the danger that the lung would not reexpand and that chronic empyema might result. In a large series of cases he had seen only one in which aspiration had been done with success. Early operation was necessary, otherwise adhesions would form and chronic empyema might result. In every one of seven cases of cerebral abscess, occurring at the Melbourne Hospital and complicating empyema, a streptococcus had been recovered. He had never seen one due to the pneumococcus. While agreeing with Mr. Hailes that the vast majority of cerebral abscesses complicating empyema were multiple, he had seen one *post mortem* in which the abscess cavity was single and superficial and operation might have saved the patient. In selecting the site for drainage he believed that the best procedure was to remove the rib immediately above the lowest spot where pus could be obtained by the exploring syringe. He congratulated

Mr. Hailes on the fact that he had had no patients with chronic empyema since he had adopted the method of low drainage.

DR. HUME TURNBULL said that the previous speakers had fully discussed the subject of empyema. In children with this disease it was fairly common to find that the breath sounds were well heard and the vocal resonance increased, but he had recently seen an adult with pleural effusion in whom the above-mentioned signs had been present and vocal fremitus had also been increased. In children an empyema might exist for months with very little rise in temperature, often not more than 37.2° C. (99° F.) and a diagnosis of tuberculosis was frequently made. He had never seen a patient with pleural shock, which he thought was nervous in origin. If local anaesthesia were used, exploration of the chest could be done frequently and there was no danger of pleural shock. He had never seen any harm result from inserting the needle into the lung. Adrenalin hypodermically would not raise the blood pressure more than twenty millimetres of mercury and he thought it immaterial whether it was added to the local anaesthetic or not. If thick pus were present, aspiration would be useless and operation should at once be undertaken. When thin fluid or semi-serous pus was present, particularly if of acute streptococcal origin, aspiration followed in a few days by drainage was the best procedure and there was no risk of chronic empyema developing. He had seen several cases of acute streptococcal empyema with thin fluid in which great harm had resulted from immediate open operation. Most chronic empyemata occurred in patients whose empyema had remained a long time undiagnosed before operation had been performed.

DR. S. O. COWEN discussed the diagnosis of interlobar empyema. While agreeing with Dr. Turnbull's statement about the anomalous signs sometimes encountered, especially in children, Dr. Cowen thought that their only reliable physical signs of a collection of pus in the interlobar fissure were flat dulness to percussion and absence of breath sounds over a small area. Not infrequently other physical signs, especially displacement of the heart's apex, were absent. In some cases the exploring needle had to be introduced as far as five centimetres (two inches) before pus was obtained. In a recent analysis of a series of cases at the Melbourne Hospital Dr. Cowen had found that the only varieties of empyema which were overlooked, were the interlobar and those on the surface of the diaphragm. He emphasized the point that empyemata of long standing were not always accompanied by continuous fever. In one such case he had seen recently, the remittent temperature had suggested a wrong diagnosis of Hodgkin's disease.

DR. C. G. SHAW said that during the late war many patients with infected blood in the pleural cavity had been successfully treated by aspiration. Here there was no infection of the pleural membrane and lung and removal of the blood got rid of the whole infection. If the patient had been operated on in order to remove the blood clot, the pleural cavity could then be quite safely and properly closed. These conditions, however, were not at all comparable to empyema occurring in civil practice. When the infection from a blood clot had spread to the pleura, drainage had been found necessary as in ordinary empyema and if it was too long delayed, chronic empyema had sometimes resulted.

There were several causes of chronic empyema, the chief of which were delayed operation, inadequate drainage and leaving the drain tube *in situ* too long. In civil practice, when early operation was undertaken, chronic empyema was rare. This was more important than the site of drainage. He had seen one patient whose empyema had remained undiagnosed for four months, the empyema had ruptured into the lung causing a bronchial fistula. Drainage had been established and the fistula, the presence of which had been definitely established by the appearance of flamine in the expectoration during lavage of the pleural cavity, had closed before the wound in the thorax had healed. This would seem to suggest that bronchial fistula was not a very serious complication. The treatment of chronic empyema was a big and difficult problem, the controlling factor being shock. It was not so much a question as to what ought to be done, as to how much it was possible to do.

DR. J. P. MAJOR said that early diagnosis was essential in the treatment of empyema. In pneumonia, if the temperature rose after it had fallen to normal, either empyema or pericarditis was probably present. If the temperature returned to normal, but the pulse rate did not, empyema should be suspected. Unresolved pneumonia was very rare and in many cases in which this diagnosis was made, empyema was present. It was usually possible in empyema to find an area over which there were flatness and absent breath sounds. Despite Dr. Anderson's figures concerning pleural shock, the exploring syringe should be used early in doubtful cases. He would like to have heard the early histories of the patients with chronic empyema with a view to ascertaining whether the condition had remained a long time undiagnosed.

DR. A. V. M. ANDERSON said that before replying, he would like to welcome Dr. Morris and to congratulate him on his election to the presidential chair. He had taken a keen interest in the Association and would make a most successful president.

Considerable difference of opinion had been expressed by the various speakers regarding the diagnosis of empyema in children and adults respectively. In adults he had found X ray examination of great value in diagnosis, especially in interlobar empyemata. If doubt still existed as to the position of an empyema, an exploratory thoracotomy was advisable.

AT THE ANNUAL MEETING OF THE WESTERN AUSTRALIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION, held on March 20, 1927, at the Claremont Hospital for the Insane, a clinical demonstration was held.

Dementia Præcox with Molluscum Fibrosum.

DR. J. E. MCGLASHAN showed a patient who had been admitted on June 20, 1908, with *dementia præcox* and had been a patient continuously since that time. On admission the presence of a macular rash which was then of long duration, had been noted. The condition had gradually progressed and at the time of demonstration consisted of small tumour formations which varied from a minute size up to that of a broad bean. The patient's age on admission had been given as forty, but it was not likely that he was so old as that.

Dr. McGlashan stated that the patient was suffering from von Recklinghausen's disease, *molluscum fibrosum* or neurofibromatosis, as it had been variously named. A patient who suffered from this disease in an advanced form, had been the subject of a popular description by Sir Frederick Treves under the title of the "Elephant Man." The characteristics of the disease were stated by Dr. McGlashan to be: (1) Nodules, first felt under the skin, giving the feeling of a pea felt through velvet. The lump increased and the skin stretched and the lump might attain any size or become pedunculated and frequently warty on the surface. A characteristic about the moderately developed lumps was the way in which they might be herniated back into the subcutaneous tissue by the finger. Sometimes the tumours atrophied, leaving behind the empty bag of skin always altered in colour. The second characteristic was the presence of pigmentation. This might be in fine freckle points or in large patches and might be very dark and warty. Usually but not always the condition was accompanied by a certain degree of feeble mindedness.

Dr. McGlashan stated that no symptoms were present except those due to the pressure or inconvenience. If, however, the tumours invaded the nerve trunks, the patient complained of neuralgia. The condition was congenital. It might be noticed in infancy, but the clinical manifestations began as a rule at puberty. Pathologically the tumours consisted of fibrous tissue, either dense or loosely packed and undergoing degeneration. They were soft fibromata and were related to the terminal filaments of cutaneous nerves and resembled plexiform neurofibromata. In some tumours primitive nerve fibres were found, but there was no new formation or degeneration of the nerve endings in connexion with them.

Adenoma Sebaceum.

Dr. McGlashan's second patient was of interest in that there was some doubt as to the relative influence of congenital and acquired causes in the formation of her rash.

This patient had been admitted to the Claremont Hospital for the Insane on January 12, 1921, suffering from delusional insanity. At that time there had been a note that she had a purple rash over her face. She had been discharged by the Board of Visitors on October 28, 1921, "not improved." She had been readmitted on November 2, 1923, and had been an inmate of the institution ever since. She was suffering from delusional insanity non-systematized. Her height was 152.5 centimetres (five feet on inch) and her weight 91 kilograms (fourteen stone seven pounds). On admission her heart sounds had not been clear and the first sound had been muffled. There had been some oedema of the feet and ankles. A note stated that she had had petechial spots on the face. The rash had become a little worse, but with very slow progress.

Dr. McGlashan drew attention to the history that there had been circulatory trouble at the time of her admission and that she had suffered from bronchitis whilst in hospital, both common factors in producing dilated and conspicuous capillaries in the more remote parts of the circulation. She presented evidences of disordered function and structure of the sebaceous elements of the face in the nature of sebaceous warts. The rash was most conspicuous over the flush area and suggested a previous or co-existing *acne rosacea* as having been an important cause. *Acne rosacea* was definitely a seborrhoeic affection. These manifestations notwithstanding, there was a distinct congenital condition underlying this. This was suggested by the condition of the mucous membrane of the mouth and the tongue. Her early history would be of interest. Was it possible that as a child she had developed *adenoma sebaceum*, a congenital disease appearing chiefly in childhood and almost always associated with some mental deficiency? The sebaton on the face suggested it; the absence of the small cystic adenomata combined with telangiectasis might be a phenomenon produced by time and bodily causes. Osler and Parkes Weber had written of a condition of this sort which was inherited, which usually developed about middle life and was associated with a naevoid condition of the mucous membranes. These patients provided many instances of hæmoptysis, hæmatemesis, melæna and sometimes profuse rectal bleeding sufficient to cause severe anaemia and often death.

Dr. McGlashan said that this was in support of his statement that this was a congenital condition probably associated with poor mentality and increased by acquired causes.

Mental Conditions.

Dr. E. J. T. THOMPSON showed four patients. He said that the four patients were either suffering from general paralysis of the insane or a differential diagnosis had to be made from general paralysis of the insane. Unfortunately in two of the cases the cerebro-spinal fluid had not been examined at the time of admission, one being admitted prior to the introduction of the Wassermann test. The other two patients had been admitted fairly recently. In all the cerebro-spinal fluid had been examined within the past month for response to the Wassermann test, the presence of globulin and of cells.

The first patient, J.K., aged forty-five years, had been admitted on January 23, 1901. The mother and son were said to have been in an institution. In 1905 the patient's wife had stated she had had no miscarriages. All children were healthy except the third, who had "snuffles" and had since been delicate. The patient had been addicted to alcohol, especially just before admission. He had always been sexually excitable.

On admission he had evidently been very troublesome and could not be examined thoroughly. No note on his reflexes had been made.

Mentally he had been restless and excitable. He shouted and sang but could give no reason for doing so. He stated that he was a lawyer, policeman, soldier, blacksmith, carpenter. He was violent and troublesome. His condition had been diagnosed as mania.

In 1901 the diagnosis had been changed to general paralysis of the insane. He had had many delusions of grandeur.

In 1902 he had been cheerful and boisterous. He had been full of grandiose ideas. The pupils had been unequal.

Early in 1903 he had had a series of seizures which were considered to be of the general paralysis of the insane type. According to the Deputy Head Attendant, who was then in charge of the hospital, all hope of his recovery had been given up and he was not expected to live overnight. He had been put on whisky and the patient had heard the doctor say that he was to have whisky. He had demanded it at the stated hours and recovered. Afterwards he had been reported as demented and childish, his general health had improved and by the end of 1904 he had become a quiet and excellent worker and a great cricketer.

In 1906 and 1907 he had been very anxious for discharge; had been simple and childish and had had a tendency to grandiose ideas. The pupils had been unequal and did not react to light; the speech had been more affected. He had been described as likely to break down at any time. Since then he had gone in cycles. Periods when he was dull and stupid and incapable of employment had alternated with periods when he was brighter and a useful worker.

In 1916 he had broken parole and cut his throat. In July, 1921, he had been found unconscious when he was out working and remained in a semiconscious condition for several hours. He had been in hospital at this time about three weeks. In September, 1921, it had been noted that he had paresis of the right side of face, but on inquiry Dr. Thompson found this paresis had occurred at some considerable time before this date. In 1923 he had been in bed with what was described as a congestive attack.

At the time of demonstration he stated that his age was sixty-seven. He could not state the year of his birth; he could state the day, month and the year. He stated that he had been in hospital for twenty-seven years and could give the date of admission. He was simple and childish, facile and laughed without apparent reason. He was hypochondriacal. He had no grandiose ideas. He was an excessive eater.

Examination of his physical condition revealed that the knee jerks were absent. The plantar reflex was flexor. No clonus was present. He had an old man's gait. Rombergism was present. The right pupil was smaller than the left, but no irregularity was present. The pupils were practically fixed. Consensual and sympathetic reflexes were not elicited. Speech was slurring, especially to test words. The tongue protruded slightly to the right and was tremulous. Paresis of the lower part of the face was present on the right side. He had a slight intention tremor. His arteries were sclerosed, consistent with age.

The cerebro-spinal fluid pressure was normal. It contained no increased globulin, no increased cells and had not reacted to the Wassermann test.

Dr. Thompson asked what was the diagnosis in this case? The original diagnosis of a manic phase of manic depressive psychosis seemed probable, in view of his condition on admission and the hereditary history.

The change of diagnosis to general paralysis of the insane seemed to be justified by his cheerful and boisterous nature; his delusions of grandeur; series of seizures and probable death; inequality of the pupils, loss of reaction to light and his affected speech. Even his present physical condition of absent knee jerks, Rombergism, pupillary reflexes, slurring speech, which of course might be accounted for by his facial paresis, tongue tremors and his enormous appetite were indicative of general paralysis of the insane.

His later history of periods of mild depression and incapability for work, alternating with periods of brightness and employment, together with his suicidal attempt in 1916, were again suggestive of manic depressive psychosis. The diagnosis of manic depressive psychosis still failed to account for his series of seizures in 1903 and the state of his reflexes. Even if the seizures had been due to a cardio-vascular condition, it seemed hardly possible that the patient would be alive. His post war apoplecticiform attack ought certainly to have carried him off.

With regard to the findings in the cerebro-spinal fluid which at the time of the meeting were against general paralysis of the insane, Dr. Thompson had failed to find any definite statement as to whether the reactions were permanent or whether in the case of remission and with passage of time they diminished or disappeared. After treatment with malaria it was known that the response to the Wassermann test still persisted, but as these were of comparatively recent date, they could not be compared with the patient under discussion. It was further stated that the gold-sol test diminished in its reaction with the passage of time, but it had not been possible to apply this test to the patients.

Dr. Thompson was still inclined to believe that the patient, J.K., was a general paralytic. A manic phase of general paralysis of the insane was well recognized, but there was also a manic depressive type which was more uncommon. The change of diagnosis by Dr. Montgomery had not been made. Dr. Thompson felt sure, merely on the fact that the patient had developed grandiose ideas. The inequality of the pupils had been noted by another doctor before the seizures occurred. The seizures had evidently been considered general paralysis of the insane seizures and had he died at this stage, he would have gone to the unknown a general paralytic, but he had remained in a partial state of remission, retaining the manic depressive phase and still with the physical signs of general paralysis of the insane. Local paresis was not uncommon in general paralysis and, though usually transient, sometimes had permanent results. His later apoplectic and congestive attacks were, Dr. Thompson thought, the results of age and his enormous appetite.

Dr. D. M. McWHAE said that in his opinion syphilis could not be excluded. In long standing cases the reaction to the Wassermann test could disappear. This had been reported. The condition of the patient suggested some form of metasyphilis, possibly *tabes dorsalis*. In fitting the symptoms together, Dr. McWhae suggested that there was a meningeal as well as an encephalitic infection present. To these could be added a manic depressive psychosis, but it was difficult to think of one individual with three conditions. This multiplicity of diagnosis was wrong in principle, Dr. McWhae concluded, and he hoped that Dr. Thompson would be able to clear up the question of diagnosis in his later remarks.

Dr. W. J. BEVERIDGE expressed the opinion that the patient was suffering from arrested *tabes dorsalis*. Dr. Beveridge then asked Dr. Thompson if there had been any long course of treatment prior to the reading of the Wassermann reaction.

Dr. Thompson replied that there had not been, nor had a provocative injection been given.

Dr. J. BENTLEY said that the late Dr. Montgomery had been of the opinion that the condition was one of cerebro-spinal syphilis and not one of general paralysis of the insane.

The second patient, J.F., a male, aged thirty-six years, had been admitted on May 10, 1920, with a diagnosis on admission of general paralysis of the insane. On admission the patient had been well developed, his pupils had been fairly equal and the right eccentric in shape. The tongue had been tremulous; the knee jerks increased. The right plantar reflex had been flexor and the left extensor in type. The speech had been slurring in type.

The mental condition on admission had been one of exaltation. The patient had had grandiose delusions that he had a few tons of money—gold and silver—stacked somewhere in Perth, but did not know where. He thought that he owned a gold mine in Kalgoorlie, that the State had built a fine house for him somewhere, but he could not find it. He had been disorientated and his memory had been poor. At times he had become restless and abusive. His delusions of grandeur had increased, until in 1923 he became a multimillionaire.

At the time of demonstration he gave his age as thirty and he stated that he had been in hospital for two years. He could tell the day, month and the year. He stated that he had millions in his house in South Australia in paper and silver, that he had shipped it over from Western Australia and that he had made the money by working in the latter State.

Physical examination revealed that the knee jerks were active. The plantar reflexes were absent. The gait was somewhat of the old man type, but he could walk in heel to toe fashion along a straight line. Rombergism was absent. The pupils were equal and reacted sluggishly to light and accommodation. The consensual reflex was very slight. The sympathetic reflex was not elicited. Speech was slightly slurring to test words. The tongue was tremulous. The face was expressionless. No tremors were present. He had had no seizures. His arteries were sclerosed. His heart was sluggish and was dilated to the left.

There was no history previous to admission available. He stated that he had laid himself open to infection, but could not remember if he had a chancre.

The pressure of the cerebro-spinal fluid was high. It had yielded no reaction to the Wassermann test and it contained no increased globulin or cells.

Dr. Thompson said that this case, originally diagnosed as one of general paralysis of the insane, showed how a delusional insanity due, he thought, primarily to a cerebral arteriosclerotic condition, could present a clinical picture of general paralysis of the insane.

Dr. Robinson, in the *Journal of Mental Science* of April, 1914, reported some illustrative cases in which the brain was examined for spirochaetes *post mortem*, showing how arterio-sclerotic conditions could give rise to a picture clinically resembling general paralysis of the insane.

Dr. R. H. CRISP asked in view of the fact that the condition was regarded as one of cerebral arterio-sclerosis, whether the retinal vessels had been examined, since they would share in the common sclerosis.

Dr. D. M. McWHAE said that he did not think that general paralysis of the insane could be excluded from the diagnosis. It was possible that the patient was in a state of remission.

Dr. Thompson, in reply, stated that the patient was not in a state of remission. In fact, there had been no improvement, but the patient was, if anything, slightly more muddled than on admission. The retinal vessels had not been examined and he would not like to rely upon his own examination, but entered a plea for the visitation of the institution by specialists.

The third patient, L.K.C., had been admitted on February 16, 1927, at the age of forty-two years. The patient had stated he had had typhoid fever and pneumonia twenty-seven years previously. He had suffered from rheumatic fever. He gave a history of luetic infection twenty-three years previously. He had been kicked by a horse about 1916 on the left side of the head. He had been sent to hospital unconscious and remained there three months.

Army records showed that he had suffered from ruptured *membrana tympani* with gradually increasing deafness. He had been discharged from the Army in 1916 "unfit" on account of deafness.

He did not seem to have been in any constant employment since, but had done occasional work and had been described as a man of good character and painstaking in his work.

Dr. Thompson pointed out that the patient was thin and poorly nourished. His heart manifested a mitral systolic murmur. The knee jerks were increased. The plantar reflex was flexor; no clonus was present. Romberg's sign was absent.

He walked normally, but fell over when walking along a line in heel to toe fashion. The pupils were moderately contracted. They reacted only slightly to light and accommodation. Consensual and sympathetic reflexes were absent. No slurring of speech to test words was present, but speech was deliberate and halting.

No coarse tremors were present in the tongue. There were no tremors of the hands or face. No intention tremor was present. The face was not typical of general paralysis of the insane.

The patient was simple and childish. He was inordinately happy and laughed for no apparent reason. He was disorientated in place and time. He could not tell where he was. He said that he was twenty-seven years of

age, but had been thirty years in Western Australia. The year was 78. He was born in year one. He was rambling and disconnected in his statements. He said that there were no police in Perth; that there was no one in Perth Hospital, but that his children slept there. He was contradictory in his statements. He had delusions that all his children had died about four weeks previously by "rotting away naturally." He had electrified his children so that they could communicate with one another at a distance. He had no grandiose ideas. He had hallucinations of hearing and taste. He heard the voice of his daughter Gertrude talking to him by electricity. His food tasted very salty. His memory was very defective for dates and proper names. He said that he would be dead the following week and laughed heartily. He was erratic in his behaviour.

He retained his delusions about the death of wife and children; they had died "by starvation." He had shown slight improvement and was better orientated. He could tell the year, month and the day. He said that his age was fifty-five and he had been in hospital six months. His memory had improved for names, but it was still defective. He would not admit hallucinations. His behaviour had improved and he was employed in ward work.

Dr. Thompson said that the patient's condition would not be called typical of general paralysis of the insane and at the time of diagnosis he had denied specific infection. The differential diagnosis seemed to rest between late *dementia præcox*, organic dementia and general paralysis of the insane. He certainly showed dementia with hallucinations and fantastic delusions, but his demeanour did not look typical of *dementia præcox*. Dr. Thompson was never impressed with a diagnosis of *dementia præcox* between the age of forty and forty-five, though it was said to occur as late as that. Organic dementia was possible, in view of the history of the accident with concussion certainly and fracture possibly, but the length of time since the accident in 1916 without any available intervening history was rather against dementia of organic origin. The increased knee jerks, the small pupils with sluggish reactions to light and the absence of consensual and sympathetic reflexes, the halting and deliberate speech, the general demeanour and happy bearing, poor orientation, contradictory statements and rather fantastic ideas, while not typical, were more suggestive of general paralysis of the insane, but it was with some hesitation. Dr. Thompson thought, that the diagnosis of general paralysis of the insane had been made by Dr. Bentley. He would not have been surprised if the cerebro-spinal fluid had been reported as normal. The report, however, had revealed a positive response to the Wassermann test, increased globulin content and six hundred and twenty cells per cubic millimetre. The pressure had been very low.

An interesting point to consider in this case was whether the accident in 1916 had been in any way a factor in the causation of the mental condition. Mott, though he considered that accident should always be taken into account as a cause, made no definite statement as to the time that might elapse between the accident and the onset of general paralysis of the insane. He stated:

Several months may elapse before symptoms of traumatic epilepsy or general paralysis may come and if such occur within a few months, rather than immediately after or a long time after, it may be presumed that the head injury was a determining factor in the onset of the disease.

The fourth patient, C.E., had been admitted on December 24, 1926, at sixty-seven years of age. The patient had given a history of syphilitic infection at the age of twenty-one. He had had typhoid fever and rheumatism.

The patient was rather thin. The heart was dilated and rather sluggish. No audible bruits were present. Some venous congestion was seen. The diaphragmatic venous collateral circulation was evident. Some congestion of the bases of the lungs had cleared up. Arterio-sclerosis was consistent with age. The knee jerks were dull, the right rather duller than the left. The plantar reflex was flexor. No clonus was present.

The gait was normal. No Rombergism was present. *Arcus senilis* was present. The pupils were equal, small, reacted slightly to light and accommodation. The consensual and sympathetic reflexes were present to a slight extent.

Speech was not affected. The tongue manifested coarse tremors. Fine tremor of hands was present, but no tremors of the face and no intention tremor.

The face somewhat resembled that of general paralysis of the insane.

Medical certificates showed that he was very noisy. He laughed for no apparent reason. He stated he was the greatest man in the world, a king and belonged to the wealthiest family. He played imaginary musical instruments and thought he was master of all the trades in the world.

On admission his memory had been defective, but he had been fairly well orientated. He had been garrulous with grandiose ideas of a varied nature, that he and his brothers were millionaires, that he was the greatest cricketer in the world and the boys called him Hobbs, he was strong and could overpower anyone in the ward, he was the Earl of Huntingdon because he saw in the library that he was related to Admiral Sir Charles E. Huntingdon, he had spoken to the Governor in the library and the Governor had asked him to give him a light. He had been childish, facile and euphoric in his bearing.

He had improved and his delusions were subdued. He was no longer a millionaire, no longer the Earl of Huntingdon, though he still hoped that his claim might bring results. He was only a good cricketer. He was well orientated, but he had loss of memory for a period at the time of his admission to Perth Hospital. He was still a little euphoric. He was a good worker.

The cerebro-spinal fluid had a normal pressure. It had not yielded a reaction to the Wassermann test. It contained no increase in cells and the globulin was not increased.

Dr. Thompson said that although they had little doubt of the diagnosis, the patient showed certain features which resembled general paralysis of the insane. His happy and euphoric disposition, his grandiose ideas, his history of specific infection and to a certain extent his nervous reflexes were not unlike those of general paralysis of the insane.

Against general paralysis of the insane were his age (although cases had been reported at sixty three years), the time between the infection and the onset of the mental symptoms, his defective memory only for a particular period and the fact that he was well orientated, though in many cases of general paralysis of the insane orientation was often very good.

The case showed how an arterio-sclerotic condition could resemble that of general paralysis of the insane and Dr. Thompson was inclined to believe that most mistakes in diagnosis from a purely clinical examination were due to an arterio-sclerotic condition of the cerebral circulation.

In conclusion Dr. Thompson said that he had shown these patients not only to illustrate the difficulty in the diagnosis of general paralysis of the insane from the clinical standpoint, but to emphasize the demented type which often lacked recognition, and the necessity for serological examination.

Most authorities seem to agree that the cerebro-spinal fluid in general paralysis of the insane manifested a response to the Wassermann test in 98% of cases, increased globulin in 95% and pleocytosis in 95%.

These reactions were also present in other types of neurosyphilis and were not diagnostic of general paralysis of the insane. The clinical picture was required to differentiate the type of neurosyphilis from which the patient was suffering.

As, in accordance with the *Lunacy Act*, the diagnosis had to be made within seven days of admission, it allowed no time for serological examinations to be done unless they had a pathologist and a laboratory at the hospital. To Dr. McGillivray, of the Public Health Department, they were greatly indebted for his cooperation and assistance in carrying out bacteriological and serological work, but they feared that if they sent him all the specimens they would

like to have examined, he would have little time to do anything else.

The announcement recently made by the Minister of the necessity for a pathologist and bacteriologist at the hospital in no way detracted from the assistance which had always willingly been given by the Public Health Department, but it would, Dr. Thompson hoped, allow them the opportunity not only of more accurate diagnosis, but also of carrying out some research work in mental conditions.

Malaria and General Paralysis.

At the conclusion of the meeting Dr. J. BENTLEY asked members to notify him in the event of their seeing a patient suffering from benign tertian malaria. It was his intention to undertake the malarial treatment of patients with general paralysis of the insane.

NOMINATIONS AND ELECTIONS.

THE undermentioned have been nominated for election as members of the New South Wales Branch of the British Medical Association:

- Biggs, Thomas James, M.B., Ch.M., 1926 (Univ. Sydney), Sydney Hospital, Sydney.
Russell, John Donald, M.B., Ch.M., 1926 (Univ. Sydney), 35, Manning Road, Double Bay.

NOTICES.

THE Scientific Committee of the Victorian Branch of the British Medical Association has arranged the following programmes of meetings, which will be held at the Medical Society Hall at 8.15 p.m. on the dates given.

- August 3, 1927.—Dr. J. F. Mackenzie: "Notes on the Dunedin Congress," with cinematograph pictures.
Dr. H. C. Trumble: "Ramisection for Spasticity."
September 7, 1927.—"Some New and Non-Official Remedies."
Dr. S. O. Cowen: "New Remedies in General Medicine."
Dr. J. T. Tait: "New Remedies in Genito-Urinary Diseases."
Dr. Kenneth McLean: "New Antisyphilitic Remedies."
September 21, 1927.—Clinical meeting at the Alfred Hospital.
October 5, 1927.—Dr. John Dale: "The Practice of Preventive Medicine."
October 20, 1927.—Clinical meeting at the Eye and Ear Hospital.

Hospitals.

HOSPITAL ADMINISTRATION IN QUEENSLAND.

WE have been requested by the Council of the Queensland Branch of the British Medical Association to publish the following communication from the Assistant Under Secretary of the Home Secretary's Office of the State. Members of the Queensland Branch are requested to read the document and to forward any comments they may desire to make thereon to Dr. E. S. Meyers, the Honorary Secretary of the Queensland Branch.

I have the honour to inform you that the Department has for some time had under consideration certain matters connected with the administration of public hospitals, particularly with regard to the form of medical control, the relationship of the medical practitioner to the public hospital, classification and admission of patients and payments by patients.

In the first place it is necessary to define a public hospital. The long accepted definition which has been

enacted into express words in *The Hospitals Act, 1923*, defines a public hospital to mean a hospital or institution which affords medical and nursing services for sick, infirm or disabled persons and accommodation for first aid or sick persons or is engaged in ambulance work or makes provision for motherhood and child welfare and which is established primarily for persons who are unable to provide such services for themselves.

The public hospital is therefore not provided for well-to-do persons or persons who are able to pay for their medical attention, but there is no objection to private or intermediate wards being provided as part of the public hospital, in fact the practice of providing intermediate hospitals or wards in association with the public hospital is being generally recognized and encouraged.

At many of the public hospitals in this State private wards have been provided and no objection has been raised to private patients being admitted to public hospitals in which private wards have not been provided, subject to the condition that such private patients paid the full cost of accommodation and nursing, so that no part of such cost should fall upon the community.

There can thus be two classes of patients, namely:

- (a) Patients admitted to the public hospital (public wards) and entitled to be so admitted and
- (b) patients admitted to private or intermediate wards, or otherwise accommodated as private patients, including patients of any medical practitioner.

Hitherto patients have been classified into three classes, namely: (a) non-paying patients, (b) paying patients, (c) private patients; and the charge prescribed for the "pay" patients has been a daily or weekly charge much below the actual cost of accommodating and nursing the patient. Also under the heading of "pay" patients persons have been admitted who have not been entitled to be so admitted.

Rules classifying and governing the admission of patients have therefore been drafted and the committee is requested to repeal all existing rules relating to the admission and classification of patients and to substitute rules in accordance with the draft rules, a copy of which is enclosed. When the committee has taken the usual procedure, the rules should be sent to this Department so that approval by the Governor in Council may be obtained.

Other consequential amendments may require to be made in the rules. In this connexion it may be mentioned that the draft rules were first drafted for the Winton Hospital Committee and the fees prescribed by that Committee have been left in the draft merely for information. Some parts of the draft rules may not be applicable to your hospital and if such be the case such parts need not be included. The draft rules also include rules relating to the medical control at the Winton Hospital and also to relation of practising medical practitioners in the matter of private patients. In order that the hospital policy herein laid down and the draft rules which give expression to that policy, may be better understood, the draft rules will be explained.

FORMS OF MEDICAL CONTROL.

The following forms of medical control may be adopted, namely:

- (1) By a whole time or fully salaried medical officer or medical staff without right to private practice.
- (2) By a whole time or fully salaried resident medical superintendent with or without a fully salaried medical assistant and with or without a resident medical staff (graduates from the universities, who receive a nominal salary) and an honorary medical and consultant staff (applicable only to the larger hospitals).
- (3) By a nominally paid medical superintendent or an honorary medical superintendent and honorary medical staff, with a resident medical officer or resident medical officers (usually junior medical practitioners or graduates).
- (4) By a part time medical officer, with the right of private practice, usually in districts where there is only one medical practitioner.

- (5) By a part time medical officer and honorary medical and consultant staff in districts where there are two or more medical practitioners.

In further explanation, it may be stated that (1) is not in operation at any hospital in Queensland, (2) and (3) are applicable only to the larger hospitals, (4) is in operation usually where there is only one medical practitioner, but not always so, while (5) is in operation in some districts where there are two or more medical practitioners. Winton is a case in point.

EXPLANATION OF DRAFT RULES.

The draft rules relating to honorary staff are only applicable where there is more than one medical practitioner in the district. The draft rules are left in for information purposes, as the adoption of the honorary medical system is not required or insisted upon by the Department. The committee can use its discretion in the matter, but if it adopts the honorary system, the principles embodied in the draft rules must be adopted, the most important principle being that no charge can be made by an honorary for his services in the public hospital, general or midwifery. If the honorary system is not in operation, the medical officer must be responsible for all patients in the public hospital, general and midwifery, and such medical officer should be paid a salary commensurate with the value of the services rendered in the public hospital. The medical officer should not be permitted to charge consultation or operation fees to patients entitled to the services of the public hospital. If an honorary system be in operation, the salary to be paid to the medical officer should be on a lower scale, as the value of his services would be much lessened by reason of the fact that he would not be solely responsible for the medical care of all patients in the public hospital.

In-Patients.

Admission of Patients.

Clause 1 of the rule relating to in-patients provides that subject to the direction of the committee, patients shall be admitted by the medical officer or matron. This clause was drafted to suit the circumstances of the Winton Hospital and will be required to meet the circumstances of most country hospitals. The words "subject to the direction of the committee" were inserted so that the committee must take the final responsibility with regard to the admission of patients and in determining whether a patient is entitled to the service of the public hospital. The object is to secure that the right of persons entitled to such service shall be maintained and the committee, as the trustee of such right, is the authority which must accept and exercise the responsibility. Clause 7 definitely lays upon the committee the duty and responsibility of determining whether any person is entitled to the services of the public hospital.

Classification of Patients.

Clause 2 classifies patients.

Charges.

Clause 3 prescribes the charges. The words "otherwise accommodated as private patients" were inserted to provide for private patients admitted to the public hospital in cases where no private or intermediate wards are provided. The clause provides for cases in the general and maternity wards.

General Wards.

The charge for patients admitted to the "public wards" is generally fixed at so much per day and the charge should as far as possible be based upon the daily average cost, but in the far back hospitals where the daily average cost is very high, the Department will agree to the rule prescribing a lesser charge, but not less than nine shillings a day. Attention is directed to the proviso which provides that no person shall be refused the benefits of the hospital by reason of inability to pay the above charges or any part thereof. Interpreted, the position created is that the charge fixed is a maximum charge and that a person who is able to pay nine shillings a day and no more is a person entitled to the service of the public hospital and therefore eligible to admission to the public wards.

If a patient has no means, he cannot pay and should not be required to pay, but every patient should be required to pay what he can afford to pay, whether it be the full charge or part of such charge. It will also be noticed that the charge covers all charges, including operations and anaesthetics. No comment is required with regard to the provision fixing charges for private patients.

Maternity Wards.

The rate prescribed for patients in the public wards is fixed at seven guineas for two weeks to cover all charges, including operations and anaesthetics. Provisions are also included with regard to patients unable to pay. If it is desired to include provisions with regard to waiting time and the collection of the baby bonus, such provision may be included. The committee is, however, required to prescribe a maximum fee of seven guineas for two weeks, which is to be the only charge which a patient is to be required to pay as a patient in the public ward. The committee must pay the medical officer by way of salary. If there is an honorary medical system in operation, the honorary cannot make any charge for any patient attended by him admitted and eligible to be admitted to the public wards.

If any person who is eligible for admission to the public wards, elects to be admitted to the private or intermediate wards or be otherwise accommodated and have his own medical practitioner, such person should be admitted, provided that he pays the full charge prescribed for private or intermediate patients.

Any medical practitioner may have patients admitted to private or intermediate wards.

Clause 4 secures to every medical practitioner (including the medical officer, if he has the right of private practice) the right to have his patients admitted to the private or intermediate wards or otherwise accommodated as private patients.

By Clause 6 private patients may be accommodated in public wards, provided no person entitled to admission to such wards shall be refused admission by reason of the bed being required for a private patient.

Accounts.

Clause 8 provides for accounts *et cetera* and makes the medical practitioner responsible in the last resort for the payment of his patient's account. The committee may enact this provision as it pleases. The committee may also enact such other reasonable and protective provisions for the collection of charges as it deems necessary.

Out-Patients.

Clause 13 provides for treatment of out-patients and gives the committee the necessary power to investigate an applicant's financial circumstances before allowing him to receive treatment. The 5s. weekly charge is the rate charged at Brisbane and is only inserted for the guidance of the committee.

General.

Summarized; hospital authorities are now required: (1) to classify patients into two classes, namely, public and private or intermediate; (2) to prescribe charges for such patients (a) for public patients in the general wards to approximate the daily average cost and that such charge must be an inclusive charge, (b) for private or intermediate patients in general and maternity wards to be a charge sufficient to prevent any part of the cost of accommodating and nursing such private or intermediate patient becoming a charge on the community, (c) for public patients in the maternity wards to be at a rate not more than seven guineas for two weeks; (3) to accept and exercise the responsibility of determining whether any person is entitled to the public hospital services provided by the community; (4) to permit any medical practitioner to have his private patients admitted and treated by such medical practitioner, subject to the conditions prescribed in the rules; (5) if an honorary medical system is in operation, to prevent any honorary from making charges for services performed in the public wards.

But it must be noted that nothing is to be taken to mean that the committee is prevented from making the

usual agreement with associations of employees and to admit them in accordance with such agreements. Such patients would have to be treated by the medical officer of the hospital, who would have to be paid a salary commensurate with the value of the service which would be entailed under such agreements.

Honorary Consulting Medical Officers.

Rule. The committee may appoint any duly qualified medical practitioner to be an honorary consulting medical officer.

Honorary Medical Officers.

Rule. The committee may appoint any duly qualified medical practitioner to be an honorary medical officer.

Each honorary medical officer may have assigned to him such number of beds as the committee may from time to time determine. Subject to these rules and the directions of the committee, patients shall be admitted to the beds of the honorary medical officers as far as practicable in rotation. The treatment of patients admitted to the beds assigned to the honorary medical officer shall be under the control of such honorary medical officer. Such treatment shall include operations, except in cases of emergency, when the medical officer shall be empowered to adopt such means as the exigencies of a case may demand.

Each honorary medical officer shall confine his visits to the patients in the beds assigned to him, but may act for another honorary medical officer if requested to do so by such other honorary medical officer, or in the case of emergency if requested by the medical officer. Every honorary medical officer shall, as far as possible, make his visits to the hospital not later than 12 noon on any day. In cases of emergency and when the honorary medical officer concerned is not available, the medical officer shall take such action as he deems necessary.

An honorary medical officer shall not make any charge for his services in the treatment of patients in public wards, including operations, except as provided in clause of rule (rule relating to in-patients).

The committee may at any time terminate the appointment of any honorary medical officer.

Every honorary medical officer shall conform to the rules and regulations of the hospital and shall, so far as they are applicable, be bound by the rules governing the conduct and duties of the medical officer. No honorary medical officer shall be eligible to be elected or appointed to be a member of the committee.

In the rule defining the duties of the medical officer the following should be included:

He (the medical officer) shall, subject to rule (that is, the rule relating to the honorary medical staff) attend all patients in public wards without any fee other than his salary.

In-Patients.

Rule. (1) Subject to the direction of the committee, patients shall be admitted by the medical officer or matron.

(2) In-patients shall be classified as follows: (a) patients admitted to public wards and entitled to be so admitted; (b) patients admitted to private wards or otherwise accommodated as private patients, *id est* patients who will be attended by their own medical practitioners to whom they will be responsible for medical and surgical fees.

(3) The charges for accommodation and treatment in the case of patients admitted to public wards and for accommodation and usual hospital service in the case of patients admitted to private wards or otherwise accommodated as private patients, shall be as follows:

(a) General wards:

(i) Patients admitted to public wards, nine shillings per day, to cover all charges, including operations and anaesthetics: Provided that no person shall be refused the benefits of the hospital by reason of inability to pay the above charges or any part thereof.

(ii) Patients admitted to private wards or otherwise accommodated as private patients:

Medical cases, four guineas per week, which shall entitle the patient to accommodation and usual hospital service, including nursing and other attention, medicines and dressings, but not extras.

Surgical cases, five guineas per week, which shall entitle the patient to accommodation, the usual hospital service, including nursing, use of operating theatre and equipment, medicines and dressings, but not extras or anaesthetics.

The charge for anaesthetics shall be two guineas if administered at night and one guinea if administered in the daytime.

The charges for X ray photographs shall be as follows:

Screenings, ten shillings and sixpence.

Photographs, one guinea first plate, ten shillings and sixpence second plate and seven shillings and sixpence each thereafter.

Dental films, ten shillings and sixpence each.

(b) Maternity wards:

(i) Patients admitted to public wards at the rate of seven guineas for two weeks, to cover all charges, including operations and anaesthetics: Provided that no person shall be refused the benefits of the public maternity ward by reason of inability to pay the prescribed charge or any part thereof.

(ii) Patients admitted to private wards or otherwise accommodated as private patients, at the rate of four guineas per week, or thirteen shillings per day, which shall entitle the patient to accommodation and usual hospital service, including nursing, medicines and dressings, but not extras or anaesthetics. The charge for anaesthetics shall be two guineas if administered at night and one guinea if administered in the daytime.

The charges for X ray photographs shall be as follows:

Screenings, ten shillings and sixpence.

Photographs, one guinea first plate, ten shillings and sixpence second plate and seven shillings and sixpence each thereafter.

Dental films, ten shillings and sixpence each.

Patients must bring all clothing required for children, a list of which will be supplied by the matron.

(4) Every medical practitioner, including the medical officer, shall be entitled to have his patients admitted to private wards or otherwise accommodated as private patients, provided accommodation is available.

(5) Every medical practitioner, including the medical officer, desirous of having a patient admitted to a private ward or otherwise accommodated as a private patient, shall make application in writing to the matron.

(6) Private patients may be accommodated in public wards, provided that no person entitled to admission to a public ward shall be refused admission by reason of the bed being required for a private patient.

(7) The committee shall determine whether any person is entitled to admission to a public ward.

(8) An account shall be issued to every patient admitted to a public ward or to the person legally responsible for such patient, which shall set out the amount due to the committee for the accommodation and treatment of such patient. The committee shall determine whether such patient or the person legally responsible for such patient is able to pay the prescribed charge or any part of the prescribed charge.

An account shall be issued to every patient admitted to a private ward or otherwise accommodated as a private patient or to the person legally responsible for such patient, which shall set out the amount due to the committee; but, in the case of default by any patient or person legally responsible for such patient the medical practitioner upon whose application such patient was admitted to the private ward or otherwise accommodated as a private patient, shall be responsible to the committee for the payment of the account and the committee shall be empowered to recover the amount of such account from such medical practitioner: Provided, however, that nothing herein shall be construed to prevent such medical practitioner from recovering such charges from the patient or person legally responsible for such patients: Provided further that nothing herein shall be construed to prevent such medical practitioner from

charging and recovering from the patient or the person legally responsible for such patient, such fee for his services as he may charge (the arrangement of such fee being a private matter between the medical practitioner and the patient).

Accounts shall be issued by the secretary.

The secretary shall advise the patient or the person legally responsible for such patient and in the case of a patient admitted to a private ward or otherwise accommodated as a private patient also the medical practitioner upon whose application such a private patient was admitted to a private ward or otherwise accommodated as a private patient, of the prescribed charges and conditions; and in the case of every patient admitted to the public ward and who declares that he is unable to pay the prescribed charge or part only of the prescribed charge, of the determination of the committee, if a charge is to be made, of the amount of such charge.

Every patient or the person legally responsible for such patient shall be permitted by the secretary or matron to peruse the rules, should such patient or person so desire.

(9) Every patient admitted to a public ward who declares that he is unable to pay any part of the prescribed charge, shall be required to make a declaration in the Form 1 of the schedule hereto and every patient who declares that he is able to pay part only of such charge shall be required to make a statutory declaration in the Form 2 of the schedule hereto that he is able to pay part only of such charge and shall sign an undertaking to pay the amount which the committee shall determine such patient shall pay and in either case to furnish evidence of inability to pay any part of the prescribed charge or part of such charge. Every patient admitted to a public ward and able to pay the prescribed charge shall be required to sign an undertaking to pay such charge in the Form 3 of the schedule hereto.

(10) Operations upon patients shall, except in case of emergency, take place at such times as shall be arranged by the medical officer or matron.

(11) Patients on admission, if so ordered by the medical officer or matron, shall be properly bathed before they enter the ward and shall be furnished with clean linen so far as is necessary.

(12) Every patient admitted to the hospital shall conform to the rules and regulations and be subject to hospital discipline.

Out-Patients.

(13) Every person applying for treatment as an out-patient shall, if so requested to do, furnish particulars of his financial circumstances and such other information as may be required by the committee, in order that his eligibility to receive treatment as a hospital out-patient may be determined.

The charges for treatment as an out-patient shall be five shillings weekly: Provided that no person shall be refused treatment by reason of inability to pay the above charge or any part thereof.

Patients shall provide suitable receptacles for their medicine or if such are supplied by the hospital, a charge of threepence will be made for such receptacle, provided that the patient is in a position to pay.

Post-Graduate Work.

MELBOURNE PERMANENT COMMITTEE FOR POST-GRADUATE WORK.

THE Honorary Secretaries of the Melbourne Permanent Committee for Post-Graduate Work announce that the following lectures will be delivered by Professor Charles Elliot, of the North-Western University, Chicago, on August 23, 1927, and following days (see THE MEDICAL JOURNAL OF AUSTRALIA, June 25, 1927, page 929).

August 23, 1927.—"The Clinical Significance of Jaundice."

August 24, 1927.—"Liver Feeding in Pernicious Anæmia."

August 25, 1927.—"Treatment of Diabetes Mellitus by Blood Sugar Control."

August 29, 1927.—"Types of Hyperthyroidism and their Manifestations."

August 30, 1927.—"The Treatment of Hyperthyroidism."

August 31, 1927.—"The Results of Thyroidectomy as a Control of Hyperthyroidism."

These lectures will be illustrated with lantern slide pictures.

The following are the subjects of the six lectures to be delivered by Professor Allen Kanavel.

August 23, 1927.—Surgery of the Hand, (a) Physiology, (b) Contracture, (c) Splinting, (d) Physiotherapy and Operative Procedures.

August 24 and 25, 1927.—Surgery of the Tendons, Cut Tendons and Suture, Torn Tendons, Restorations of Tendons, von Volkmann's Contracture, Snapping Finger, Surgery of Nerves.

August 29, 1927.—Joint and Bone Surgery: Resection of Joints, Restoration of Bone, Regrowth, Osteomyelitis, Transplants, Fracture and Dislocation of the Carpal Bones, Tumours, Cosmetic Surgery, Fat Transplants.

August 30, 1927.—Dupuytren's Contracture; Tuberculosis of Tendon Sheaths; Gangrene.

August 31, 1927.—Congenital Deformities; Skin Grafting.

Professor Elliot's lectures will begin at 8 o'clock and Professor Kanavel's lectures will begin at 9 o'clock in the evening. The fee for the series of lectures is five guineas. A reduced fee of two guineas will be charged to resident medical officers of the metropolitan hospitals. Those wishing to join the course are requested to send in their names as soon as possible to the Honorary Secretaries, Dr. J. W. Dunbar Hooper and Dr. Harold R. Dew, 12, Collins Street, Melbourne.

Obituary.

PERCY LANGFORD TOWNLEY.

THE medical profession has recently sustained a great loss by the death of Dr. Percy Langford Townley, of Gayndah, Queensland.

Percy Langford Townley was the eldest son of the late Captain and Mrs. Townley who arrived in Australia in 1863. Born in Brisbane in 1863, he was educated at the Ipswich Grammar School, where he became *dux* of the school at the early age of fourteen years. From there he matriculated to the University of Sydney, where he obtained the degree of bachelor of arts with second class honours in classics, mathematics and chemistry. In his medical course he secured honours in anatomy, physiology and pathology and graduated as bachelor of medicine and master of surgery in 1890. He was then appointed to the resident medical staff of the Royal Prince Alfred Hospital, Sydney and later on to that of Sydney Hospital.

In 1892 he married Miss Edith Houston-Hall, younger daughter of the late Rev. R. Hall, M.A., of His Majesty's Forces, Isle of Wight.

He began practice at Ipswich, later on moving to Esk and Muttaborra and finally settling at Gayndah in 1898, where he was appointed medical officer to the General Hospital. Since that time until his recent death Dr. Townley had given of his best to the people of that district. Nothing deterred him from carrying on his work and in several instances he had to swim rivers in order to reach his patients. He was always at his post and the night prior to his death he actually went to bed with his clothes on to be ready for the usual urgent night call.

Apart from his professional duties Percy Langford Townley took a great interest in local and public affairs. For some years he was an alderman of the town and at one time held the office of Mayor. He was President of the Gayndah Branch of the Royal Automobile Club of Queensland and Honorary Surgeon to the Central Burnett Football Association. The donation of the hospital site was one of the many generous acts which he performed. He was a man who lived for his work and he died, as he desired, while at the work he loved.

MILES GORDON KITE.

WE regret to announce the death of Dr. Miles Gordon Kite, of Edgecliff, Sydney, which occurred as a result of a motor car accident at Yerrinbool, New South Wales, on July 9, 1927.

ABRAHAM HAYNES.

WE regret to announce the death of Dr. Abraham Haynes which occurred at Healesville, Victoria, on July 11, 1927.

EUSTACE WILLIAM FERGUSON.

It is with regret that we announce the death of Dr. Eustace William Ferguson which occurred at Wahroonga, New South Wales, on July 18, 1927.

Books Received.

RESISTANCE TO DISEASE: PRIMARY AND PARAMOUNT NATURAL DEFENCE AND IMMUNITY: A NEW ORIENTATION by Harry Merrall, M.B., Ch.B.; Revised, Enlarged and Cheaper Edition; 1927. London: Williams and Norgate, Limited. Post 8vo., pp. 216. Price: 6s. net.

THE FLUSHINGS OF THE MENOPAUSE, by John H. Hannan, M.A., M.D., B.Ch. (Cantab.); 1927. London: Baillière, Tindall and Cox. Demy 8vo., pp. 60. Price: 3s. 6d. net.

PULMONARY TUBERCULOSIS, by G. T. Herbert, M.A., M.D. (Oxon.), M.R.C.P. (London); 1927. London: Edward Arnold and Company. Crown 8vo., pp. 219. Price: 7s. 6d. net.

Diary for the Month.

JULY 26.—New South Wales Branch, B.M.A.: Medical Politics Committee.

JULY 26.—Illawarra Suburbs Medical Association, New South Wales.

JULY 27.—Victorian Branch, B.M.A.: Council.

JULY 28.—New South Wales Branch, B.M.A.: Branch.

JULY 28.—South Australian Branch, B.M.A.: Branch.

AUG. 2.—Tasmanian Branch, B.M.A.: Council.

AUG. 3.—Victorian Branch, B.M.A.: Branch.

AUG. 3.—Western Australian Branch, B.M.A.: Council.

AUG. 5.—Queensland Branch, B.M.A.: Branch.

AUG. 9.—Tasmanian Branch, B.M.A.: Branch.

AUG. 9.—New South Wales Branch, B.M.A.: Ethics Committee.

AUG. 10.—Central Northern Medical Association, New South Wales.

AUG. 11.—South Australian Branch, B.M.A.: Council.

Medical Appointments.

Dr. Oswald Joynt (B.M.A.) has been appointed Acting Medical Superintendent for the Hospital for the Insane and Receiving House, Royal Park, Victoria.

Dr. Arthur Aubrey Palmer (B.M.A.) has been appointed a Member of the Dental Board of New South Wales.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xx.

ALFRED HOSPITAL, MELBOURNE: Honorary Assistant Surgeons for Diseases of the Ear, Nose and Throat (2), Honorary Assistant Ophthalmic Surgeons (2), Honorary Assistant Dermatologist.

MELBOURNE HOSPITAL: Honorary Surgeon for Out-Patients.

RACHEL FOSTER HOSPITAL FOR WOMEN AND CHILDREN, REDFERN: Medical Officer (Female).

SAINT VINCENT'S HOSPITAL, SYDNEY: Honorary Anaesthetists (3).

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester United Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phoenix Mutual Provident Society.
	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	Members accepting appointments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing. Brisbane United Friendly Society Institute. Stannary Hills Hospital.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	All Contract Practice Appointments in South Australia. Boomer Centre Medical Club.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Contract Practice Appointments in Western Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	Friendly Society Lodges, Wellington, New Zealand.
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington.	

Medical practitioners are requested not to apply for appointments to positions at the Hobart General Hospital, Tasmania, without first having communicated with the Editor of THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales.

Editorial Notices.

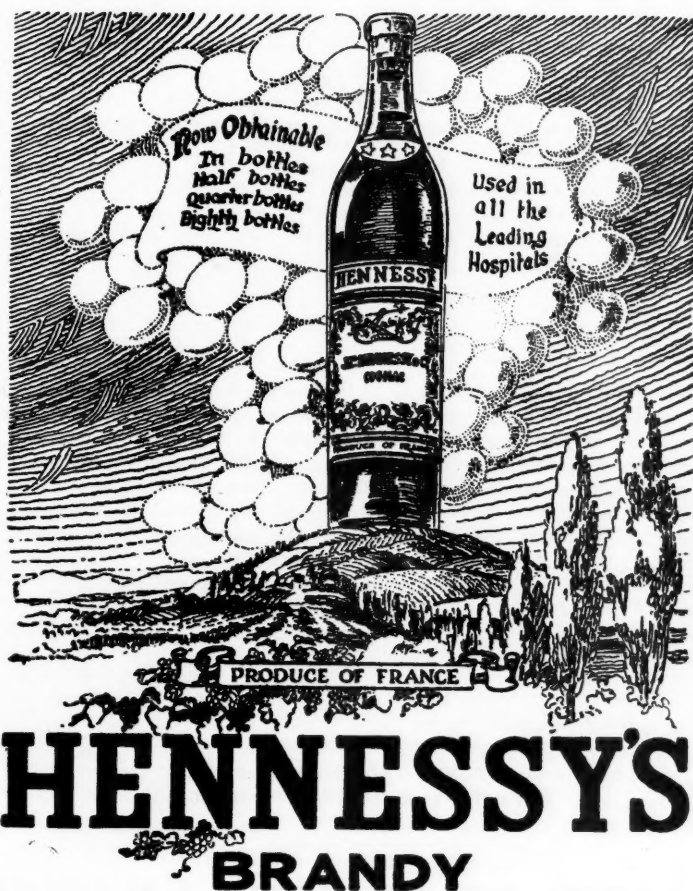
MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, Sydney. (Telephones: MW 2651-2.)

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Recent Clinical References—Lancet, Nov. 14th, 1925.

Prescriber, Dec., 1925.

British Medical Journal, Jan. 16th, 30th, Feb. 6th, 20th, 1926.

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